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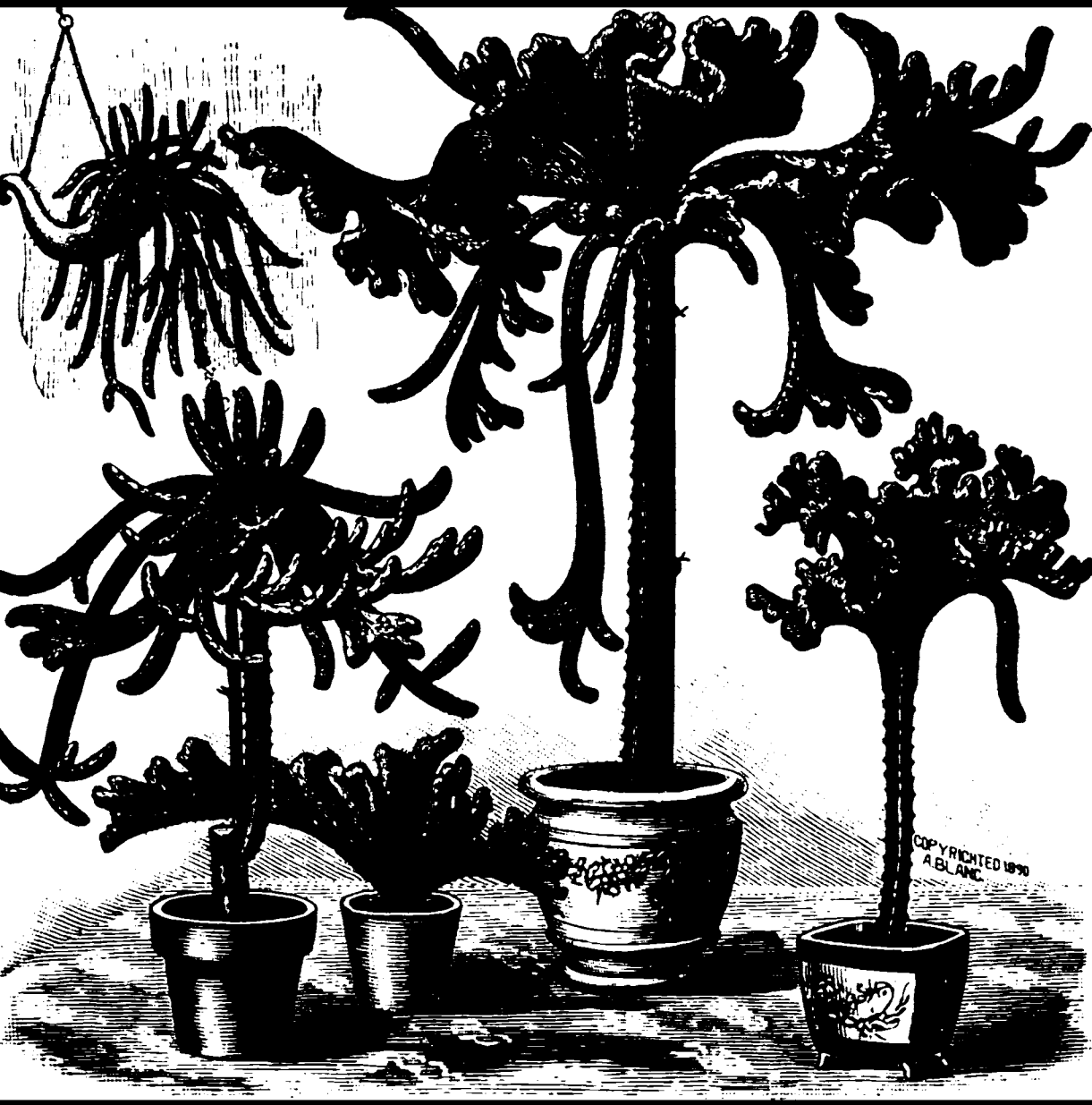

The Cactus journal

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THE

CACTUS JOURNAL.

Devoted exclusively to Cacti and other Succulent Plants. With Illustrations.

VOL. II.

FEBRUARY, 1899, TO JANUARY, 1900.

EDITED BY

F. A. WALTON,

HANDSWORTH, BIRMINGHAM, ENGLAND.

LONDON:

PUBLISHED BY E. W. ALLEN, 4, AVE MARIA LANE, E.C.

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LONDON :
PRINTED BY W. H. AND L. COLLINGRIDGE,
ALDERSGATE STREET E.C.

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The Cactus Journal.

VOL. II. No. 1. FEBRUARY, 1899. PRICE SIXPENCE.

EDITORIAL.

WE are very glad to be able to announce to our readers that the CACTUS JOURNAL so far has been a success, and that there are prospects of the success being greater as it becomes more known. We are continually hearing from fresh Cactus growers (or, rather, names that are fresh to us, although, in some cases, they have been Cactus lovers for many years), and the subscribers' list is gradually lengthening.

***

WE hope and trust none of our old subscribers will leave us, for we may here say that the more subscribers we have, the better we shall be able to make the JOURNAL worth its cost by adding numbers of new and original illustrations. The blocks to produce these are expensive, and we wish in time to illustrate every known species, and many varieties, of Cactus and allied succulent plants.

***

WE are making special arrangements to do this more effectually by having good photographs taken of typical individual plants, so that the CACTUS JOURNAL may become a standard book of reference when bound up in its yearly volumes. The index has, we are glad to say, given satisfaction, if we are to judge from letters received; and the special illustrations, both the collotype and the half-tone photo blocks, are acknowledged as good as can be produced. Some of our friends are framing these, and we have been asked to supply duplicates for this purpose. This we can do at a uniform price of threepence each for all, except those appearing in the first number, 1898. Anyone requiring any of them should apply to *The Editor*, care of Mr. E. W. ALLEN, 4, Ave Maria Lane, London.

THE fine, white art paper upon which this number is produced is much more expensive than that hitherto used, but we think the additional clearness and detail shown in the smaller illustrations will well repay us. It is our aim to make the JOURNAL as good as it can be made; we do not say profit is not the object, but we do say it is not even the *principal* object of the proprietors. Still, no paper was ever a real success that was not financially one, so we must ask our subscribers to kindly send their yearly subscriptions, and we shall be glad if they will endeavour to induce their friends to also subscribe.

***

WE shall also be glad if our readers will, if convenient, become *annual* subscribers, as it facilitates matters; but let it be distinctly understood, half-yearly subscribers are also welcomed, and the Editor will be glad if all subscriptions are forwarded to him personally, care of Mr. E. W. ALLEN, 4, Ave Maria Lane, London.

***

WE hear from our Editor (who is now in California, the home of Cacti), that by the kind permission of the director of the Missouri Botanical Gardens at St. Louis, he has been able to obtain many photographs of fine specimens of Cacti and Succulent plants, which he hopes to reproduce in the coming numbers of the JOURNAL. We also hope to give some account in our next number of some of the plants and their native homes as seen by our Editor. We are sure that these papers and photographs will prove interesting to our readers, who, we are glad to say, are greatly on the increase, which is a source of great encouragement to us, as our aim is to make the JOURNAL both interesting, as well as instructive.

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A MONSTROUS OPUNTIA.

GIANT, perhaps, would be a better adjective, as "monster" is connected in the mind of the cacti cultivator with that curious malformation which becomes fixed by cultivation.

This opuntia is a giant indeed, and but three years old from a cutting. It is at least twenty feet tall, and the spread of its branches is considerably more. I was told it is a type of *O. Engelmanni*, although vastly different from another variety in my garden, also an *O. Englemanni*.

The large jointed variety is said to have been introduced into California by the old mission fathers, and was cultivated to indicate boundary lines, for which it is eminently fitted. The joints of this large opuntia are very long and broad; a fresh, dark green as to colour. It is not an uncommon occurrence to have joints twenty-eight inches long and fifteen to sixteen inches wide.

The spines are pure white, from one-half to an inch in length. It is a very profuse bloomer, each joint will bear from six to thirty flowers. But the flowers are so disappointing. On such large joints one might be led to look for large flowers, but "things are not what they seem," and the flowers are small and insignificant; as to colour, a faded pinkish yellow. The most striking characteristic of this plant lies in its fruit, which is large—about the size of a large goose egg, and and when ripe almost pure white as to colour. The pulp, in consistency and taste, somewhat resembles the pineapple, but is much sweeter. When fully ripe this fruit is very delicious, firm and richly flavoured, albeit a little troublesome to prepare for eating, as it is covered with minute spine tufts. Its rich, fruity flavour compensates for time and trouble, however. It is usually thrust and held on a pointed stick, when the thick outer rind will peel off as readily as a banana skin. Sliced and sprinkled with lemon juice it is a delicate dainty; the lemon juice counteracts the intensely sweet taste, and gives a desirable sub-acid flavour. The fruit also makes an excellent compote, stewed in a rich syrup made piquant with lemon juice and a few spices. Prepared in this manner and sealed in glass jars they form an excellent sweetmeat for use during the winter. Baked in a brisk oven and served hot with slices of lemon it forms an ideal breakfast dish, and will command the approval of a finished epicure.

To most people cactus fruit is a gastronomic surprise, and many sceptical turn up their noses at my savoury cactus compote and delicious baked cactus fruit, and esteem it an invention of some evil spirit; but "opuntia compote" (after all there is something in a name) is a different thing entirely over which these people, who mistake it for a new Japanese fruit, become truly enthusiastic. Cactus compote is, of course, unfitted for the even hum-drum of everyday life, at least, to those people who live "back East," and grow their cacti in pots, but it is a dainty you could smack your lips over in pleasing reminiscence and dream about the days when dried "apple sass" is plenty, but the toothsome compote is not.

In preparing the fruit for culinary purposes a quick method of divesting the fruit of its thick spiny skin is to immerse it quickly in boiling water, when the outer covering will slip off easily.

Some day I shall experiment in making cactus fruit jelly, of which I have had glowing accounts. I know the Arizona tribes of Indians cook the fruit of *Cereus Giganteus* into very palatable preserves, and sell it in pots of their own manufacture; but they do not use any sugar, and I have never been able to fathom their mode of preparation. In their method the fruit is similar to our marmalade, very thick, with a honeyed flavour, too sweet for civilized palates.

When I make my cactus fruit jelly I shall use with this opuntia some fruit of my other variety of *O Engelmanni*. It is not so large as the other variety, and contains a multitude of hard seeds enclosed in soft sweet pulp, in colour a rich carmine, which will give my jelly a lovely ruddy tint.

You can observe that I do not regard the opuntia with the naturalists' eyes solely, but from an edible point also. In curious contrast to this giant of opuntias is the modest *O. pulchella*. The edible

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part of this cactus consists of its tuberous root, which contains a fibrous pulp. It is not to be recommended to the modern epicure as a beguiling relish, as it has an unfinished flavour—a woody taste, in fact—which requires a profound ignorance of the gastronomical art to appreciate; but appetites vary, and the Nevada squaw gathers this curious harvest and roasts the tubes in hot ashes, when they are consumed with great avidity, even the little papoose expands into an appreciative grin over this queer feast.

ELEANOR M. LUCAS, *Southern Florist.*

ECHINOCACTUS SETISPINUS.

ECHINOCACTUS SETISPINUS is a species of cactus that should be grown by all who grow flowers, whether they delight in the curious form and growth of the species of the cactus family or only grow flowers for the sake of flowers.

Those who raise cacti will have it; but to those who grow flowers for flowers I would especially recommend it on account of its very free blooming as well as for other good qualities. The globular-shaped plant is crowned from the first of July until November (I judge from my own plants) by large yellow flowers with a satin-like lustre, and having a ring of red in the centre, besides the very numerous yellow stamens arranged in circles also.

As to care required, this cactus approaches as near to the "absolutely no care needed" kind as any I know of; in the summer it may be kept indoors or bedded out in the pot, and after flowering, if not deemed of sufficient beauty to place among the begonias and geraniums, or the room is wanted for others, it will winter nicely in any odd corner where it will not freeze, or may be kept in the cellar—dry, of course—and in the spring when brought up, set in a dish of water to thoroughly wet the ball of soil through. It will be considerably shrivelled up by its long fast during the winter, but soon assumes its natural size and puts forth buds to gladden the eye and cheer the heart of the owner. When brought out from its winter quarters, a few red, fleshy berries about the size of small cranberries will be found upon it; these are the fruits of last year's flowers, and serve as ornaments until the buds start.

Mine are growing in very poor, heavy soil; have not tried any richer soil, as I am satisfied with the returns I get from them as they are. Have plenty of flowers and the plants are healthy. Will bloom when small, and increase in quantity and quality as the plant enlarges in growth.

Anyone who tries one of these plants, whether an admirer of cacti or not, cannot help being satisfied with the results, and I earnestly recommend it to all flower lovers. Try one, it is cheap and beautiful.

ANEMOS.

NOTE.—As *E. setispinus* is easily obtained, it is, because of its robust growth, symmetry, and readiness to blossom when quite small, especially adapted for grafting upon a good sound stock of *Cereus grandiflorum* or *C. nycticalus*. Such grafts increase in size, beauty, and value yearly—try it this season; cut the cereus quite pointed and push rather beyond the cut into the *E. cactus*, simply remove the roots and make a shallow excavation.—*Southern Florist.*

TIMELY HINTS.

ONE great fault of many, if not most, Cacti culturists is the keeping of Cacti at too high a temperature during winter. Let us remember that most of our plants in their native habitat are subjected to quite low temperatures—and we have actually made weaklings out of many sturdy, hardy plants. Cold and dry should be our guide for most of our plants, *Epiphylli* and *Phyllocacti* and tropical species of course excepted; and thus, after a season of rest, as nature demands, our plants would respond to the awakening of nature in spring.

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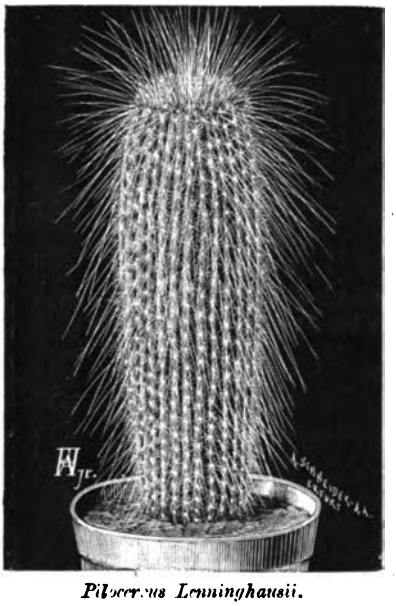
PILOCEREUS.

PERHAPS the *Pilocerei* are the least known and the least grown of any of the *genera* of *Cacti* in Great Britain.

This may be accounted for, probably, by



Pilocereus Lenninghausii.

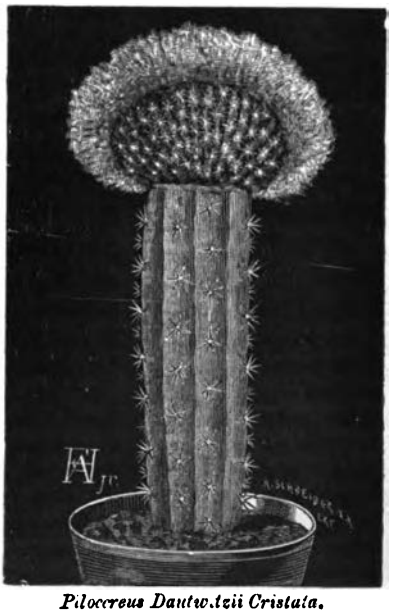
the fact that they are more delicate, and require more heat to keep in good health than most other genera. Besides, they so seldom flower until they become quite large plants, that few have seen their flowers in this country. Still, these are some of the strangest and most curious among Nature's strangest and most peculiar family of plants, viz., the Cactus.

The most common, and one of the most distinctive, is *Pilocereus senilis.* This strange plant grows in its native habitat to ten or even twenty feet high. Its great hoary heads are very peculiar when seen dotted over the mountain slopes. The hair-like spines are sometimes eight or ten inches long, and entirely hide the stem of the plant. Young plants, from six inches to a foot high, however, are very interesting, and always look well, as they are completely covered with the long hair-like spines. There are also a few shorter straight spines intermixed with the long flexuose ones, but they are hardly seen.

Pilocereus Dautwitzii is something after the same style as the above, but smaller, and the hair-like spines are as fine and silky-looking, like a quantity of white floss silk, covering the plant, especially at the top. There is a crested variety of this (*see* illustration) that is very curious and rare. The ridge or growing edge is so covered with the silky spines that the body of the plant can only be seen from the side. The one represented is grafted. This is often practised with the rare kinds of Pilocereus on account of their delicate constitution; besides, if the stock selected is a good fast grower, the extra amount of sap produced soon makes the Pilocereus into a good plant.

Pilocereus Hoppenstedtii will be seen from the illustration to be covered with very long straight hairs. This is also an extremely rare kind and seldom seen. It is a native of Mexico and very distinct.

Pilocereus Bruennowi has many more of the long, thick sharp spines mixed with the hairy ones. It is an older variety, rarely more than two or three inches



Pilocereus Dautwitzii Cristata.

thick, and is very handsome. This is not so rare as some of the others mentioned, and very soon makes a handsome plant if

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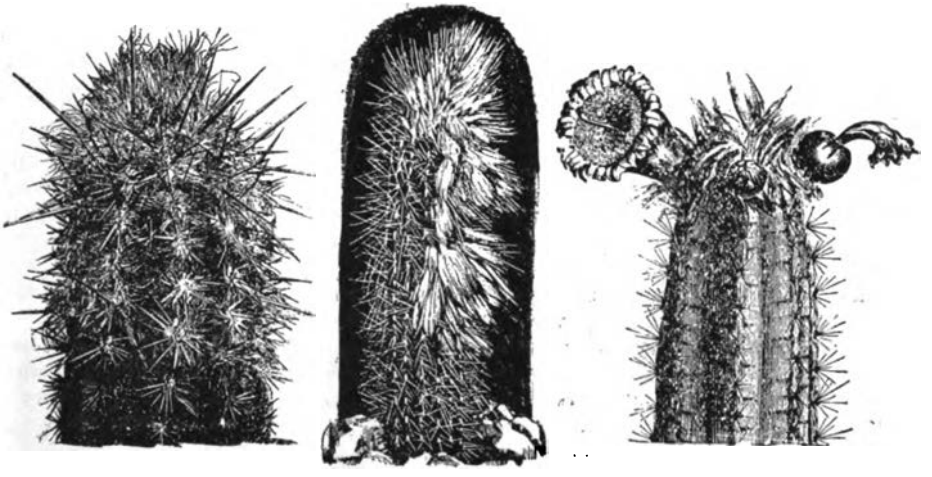
grafted upon a strong-growing *Cereus*. The thicker spines are a bright brownish-red, and the thin ones nearly white, showing a handsome contrast especially when grown in pure country air away from the smoke of towns—even there the new growth is very handsome.

Pilocereus Fosnulatus is well illustrated. The fine hairs are usually found in tufts or branches, more upon one side than the other. This, like most *Pilocereus*, forms a kind of head of the fine hairs, out of which the flowers are produced. This is frequently upon one side of the plant near the top. This is also a Mexican plant and is sometimes eight or ten feet high.

Pilocereus euphorbioides is not so rare or so handsome in its younger state. It has some white hair (but not much) distributed over its surface, and quite a bunch of ragged locks near the growing point. This is a Mexican plant and is fairly easy to grow, strikes easy, and it is quite unnecessary to graft it upon any other cactus, for it forms its wood very quickly and is strong rooted.

Pilocereus Williamsi is something like *Bruennowi* but not so handsome. It is, however, very well worth growing in a collection.

Pilocereus Celsianus and its several varieties is a more robust grower than



P. Bruennowi. *P. Fossulatus.* *P. Houlletianus*

Pilocereus Houlletianus has few hairs except at the end from where the flowers spring (*see* illustration). This is rather a rare kind seldom seen over this side, and is not so distinctive as many others.

Pilocereus Sargentianus is another rare kind, having *no* hair-like spines until the head is formed and flowers produced, but the short, thick spines occur in tufts all joined together like a rose with one longer central spike. If one of these spines is touched roughly the whole group is knocked off. The stem of this plant is about six-angled and very handsome.

Pilocereus Schotti is similar to the above but is not identical with it, as some writers assert. The little tufts of spines are smaller and closer together, although the stem may be even five inches thick. This is from personal observation.

most kinds, and should find a place in all collections of *Pilocerei.*

Pilocereus floccosus is very distinct, having tufts of fine woolly hair in tufts.

Pilocereus columni Trajani is a very rare Mexican plant having many ribs, and very distinct nodule like tufts of *short* spines set with great regularity.

There are a great number of other scarce and curious kinds, but space prevents further description at present.

A VERY handy article for a cactus cultivator to have at hand is a good magnifying glass. With it a great many hidden beauties can be seen, to say nothing of discovering a great many things that we don't want to see, in the way of mealy bugs, etc,

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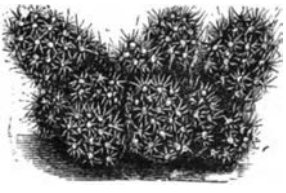
MINIATURE CACTI AND OTHER SUCCULENT PLANTS.

(Continued from the December Number.)

In the December number *Mammillaria* was treated upon, and special reference was made to *M. cirrhifera longispina*, an illustration of which is now inserted. This will give a much better idea than all



Mam. Pusilla.

the verbal descriptions possibly can of this wonderful plant.

M. pusilla was also omitted. This is easily grown, and is a great favourite with most on account of its pretty little flowers and scarlet berries. It is a native of the West Indies, and varieties are also found in Texas, New Mexico, and Arizona. The illustration will give a good idea of the general habit, which is much branched.

M. elongata, with its many varieties, was omitted. This is another general favourite. The stems are usually from ½ to ¾ of an inch thick, and two to four inches high, is often much branched, and has spines varying from a creamy white in some kinds to a rich yellow in others. The tubercles are placed rather far apart, and the pretty little clusters of short spines—usually in the form of a star—give the plant a charming appearance. It is easily grown, but apt to decay near the roots in the winter, if the least excess of water is given. The spine clusters, however, interlace, and often in the spring some of the branches upon being touched collapse, being quite hollow and only held together by the spines.

M. pectinata is one of the very best and largest flowers among *Mammillaria*. The illustration will show its relative size with regard to the plant. The flower is bright yellow, and opens several days in succession.

Echinopsis Mulleri is perhaps the very best of this beautiful and easily grown genera. But how seldom you see it really well flowered. The illustration will show how it does flower, and the relative size of each flower to the plant. A plant from two to three inches across is quite large enough to have a number of flowers on in one year; but this and most other kinds of Cacti require a large amount of sun in the autumn and late summer to ripen the year's growth, and little or, better still, no water all winter until, say, the end of March. If this be rigidly adhered to you will be surprised and gratified by the number of beautiful flowers you will get. Never mind if the plants do look shrivelled and dry, leave them alone and you will be repaid. The flowers upon *E. Mulleri* are sometimes called double, on account of the quantity of petals. It, and in fact most of the *Echinopsis*, will do well in the garden all summer, in fact some will stand the frost, but the damp of winter is apt to prevent flowering, so it is best to take them up and store them until spring. There are two kinds of this species on the market, one a short spined one from the Continental growers, and another with much longer spines and a lighter coloured green stem. Both are good.

Echinopsis Eyriesii is also illustrated, showing flowers and a number of small offshoots. These latter are found more or

Mam. Pectinata.

less upon all the *Echinopsis*. They are easily detached, a touch will often break them away; and if placed upon the soil, they very soon root, and in, say, three years or so, form good-sized flowering

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plants. It is a very pretty sight, an *Echinopsis* covered with its numberless offshoots, almost like a hen and chickens, but these little plants take some of the nourishment from the old plant that would go to the flower, or increase the bulk of the old stock; so it is, perhaps, better to remove them almost as soon as they appear, unless it is desirable to increase the number of your plants. This may even be done by placing the tiny little shoots, if only as large as a pea, upon the soil, and they will take root, but of course, take longer to form flowering plants than those left upon the parent stem until they are, say, an inch long.

Echinopsis oxygona has beautiful large trumpet-shaped flowers (see illustration) often as large or larger than the whole plant. Its treatment should be similar to the previous one.

Echinopsis multiplex is also a desirable

Echinopsis Mulleri.

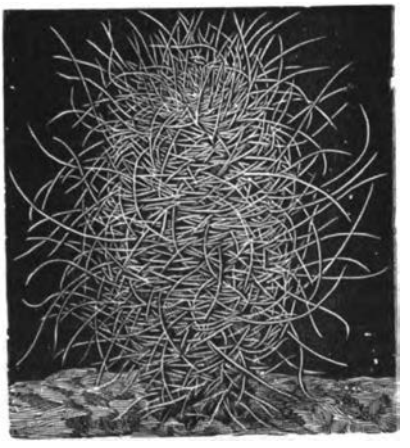
kind, which increases by its offshoots at a great rate. There is also a crested variety which is much admired for its peculiarly contorted form.

Echinopsis Pentlandi, with its many varieties and hybrids should find a place in all collections of miniature Cacti. The flowers of this kind are much shorter in the tube, but vary much in colour, and the plant itself has almost the look of an *Echinocactus*. The stem often becomes very much elongated, and is covered with narrow tubercles placed alternately, not in ribs, and give the plant a very distinct appearance. The colour of the stem is a very dark green, and the flowers are of all shades of red, pink, orange, and yellow. One variety, *longispina*, has spines from one to two inches long.

There are a great number of species and varieties of *Echinopsis*, owing to the ease with which they can be hybridized, and are, perhaps, the commonest of all Cacti

Echinopsis Eyriesii.

(except the large red-flowering *Phylocactus*), grown in this country. They make charming miniature plants, but if you keep them for a very long period they will grow into quite large plants, in fact, they sometimes become several feet high, but that is after, perhaps, from twenty to fifty years' growth. Few kinds of Cacti, however, are such



Mam. Cirrhifera (Longispina).

profuse bloomers, and have such large flowers while in the young or miniature state.

(To be continued.)

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OPUNTIÆ.

After a warm day's ride on the cars from Kansas City, and a night's irregular sleep, I was agreeably greeted with the beauties of the plain in early morning. There had been plenty of rain, and as far as you could see were plants of different colours; but the most conspicuous for beauty and delicacy of bloom is the Prickly Pear. This plant is very small in the sandy plain. I never saw one leaf above another; all seem to grow direct from the ground—some leaves bearing half a dozen blooms—lemon being the most prominent colour. But there is a lovely shade of pink, also orange and white. I could not see the colours of spines (as we were late and trying to make up our lost time). How strange, yet nature has given (what most people call ugly) that plant such a beautiful bloom and range of colour.

As we went on we came to the *O. Arborescens*, scattered and in groves. The young growth giving that refreshing green of spring, which lends so much beauty to all nature. This Cactus grows from one to three feet tall. The blooms are single and of a very pretty shade of red.

I have been in the country around Denver, and I find only *O. Rafinesquii*, with lemon coloured flowers, changing to orange and dashes of red. The spines are of various colours and arrangement; some are brown, long, changing near the leaf to a brick red. Other plants are thickly covered with white spines, yet the blooms of all are alike. It is from the bloom that I place them *O. Rafinesquii*. I examined some with both colours of spines; in that case they were not so long as the brown or so thick as the white, yet the blooms were the same in colour, shape and bud. All are full of blossoms, some bearing six or more blooms, buds or fruit on the same leaf. The fruit is exactly like the *Missouri O. Rafin.*, but I find one thing missing—the mullein leaf with which to rub off the spines as I did in childhood when I found a ripe Prickly Pear.

The *O. Arbor* grows only around Pueblo, but I have seen fine specimens in gardens at Colorado Springs, blooming as if in their native home.

On the plains among the Cacti the native Yuccas were in full bloom, swaying their white bells in the breeze. A very dainty fragrance is emitted from them. When the bells are open you see more beauty—each petal striped with green, the stamens and pistils showing their beauty in a yellow dress.

Then the Thorn Poppies, with their pure white blossoms and pea green foliage; but be careful, they are closely related to the Cacti, and, like the Yucca, are armed with spines or thorns.

I hope to see more of the Colorado Cacti and study them closely.

Southern Florist. M. D.

ECHINOCACTUS CYLINDRACEUS LONGISPINUS.

Our special illustration this month was taken from a very handsome specimen received from California. The plant is about a foot across, and is covered with the most marvellous spines imaginable; some are five or six inches long, and are strong, bent, and twisted in all directions, forming a complete coat of armour, and almost hiding the body of the plant.

It is no doubt a variety of *Echinocactus Le Contei*, which was first discovered by Dr. Le Conte on the lower Gila river, and afterwards found by Dr. Biglow on the Colorado river, also by Dr. Schott in Western Sonora. We have never seen the flower, and Dr. Schott describes it as being two inches long, somewhat campanulate, petals lemon-yellow, with a brownish tint along the mid-rib; flowers produced in August and September.

This plant is found in Southern California, in some cases attaining quite large dimensions, being four or five feet high, and about a foot thick, and in some cases fifteen or sixteen inches thick. The plants sent to this country, however, are usually globular in form, being young plants. It is hardly possible to imagine anything more suitable for withstanding

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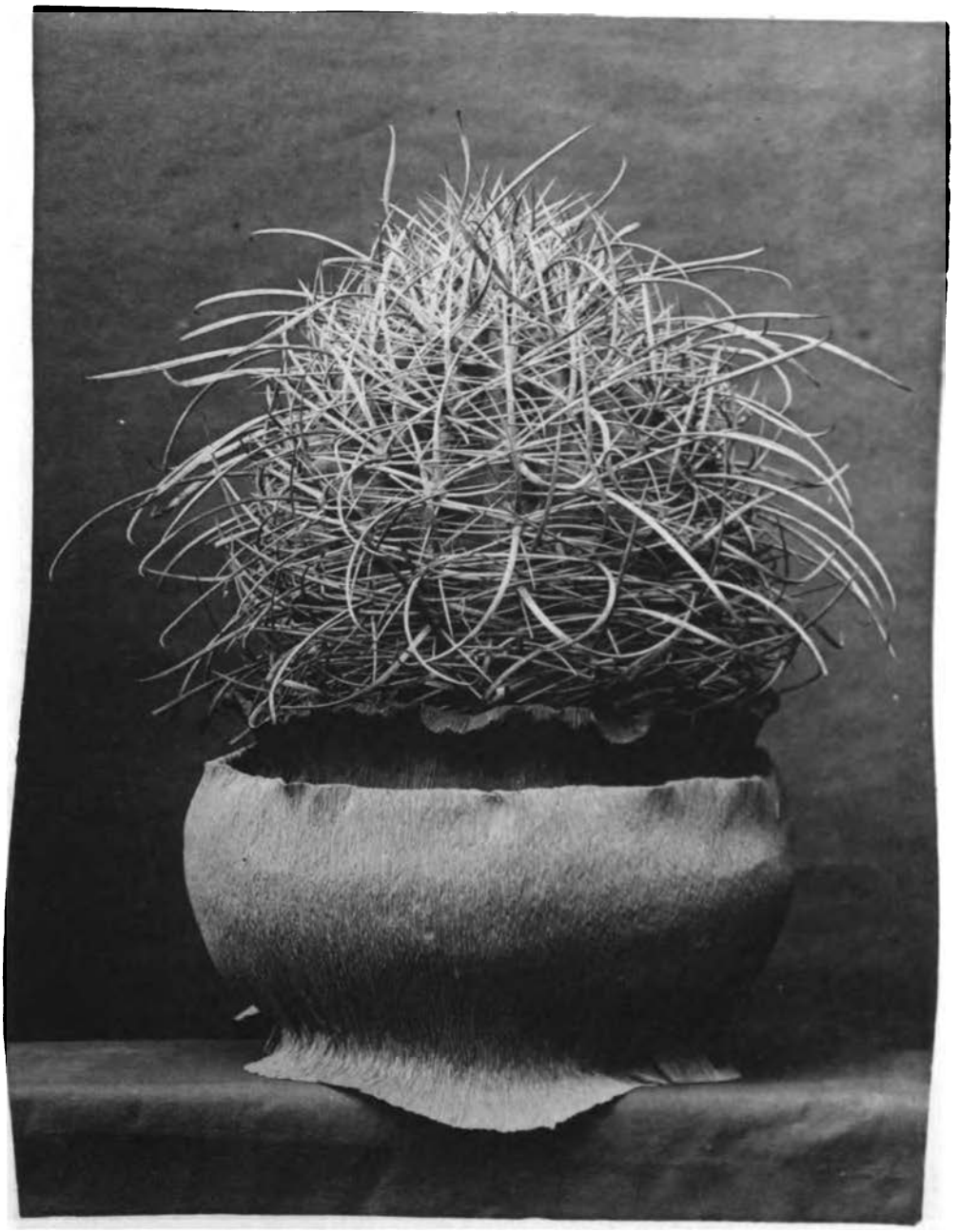

Echinocactus Cylindraceus Longispinus.

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the very adverse conditions under which it is found growing.

Its heavy coat of long spines would protect it from the attacks of any herbiverous animals, even the horse or mule would not venture to attack it with their hard hoofs.

Then, again, its hard, tough skin saves it from the attacks of most insects, and prevents evaporation of its moisture, while its great bulk of solid, juicy flesh renders it independent of frequent rains; in fact, sometimes the usual annual rainfall misses the district where these plants grow, and they have to wait another year before being able to absorb the necessary moisture to sustain life. In examining the branches of spines, they are found to vary very much, but usually contain from fifteen to twenty in each group. There is usually one much longer than the others, but there are several very long ones in each bunch. They are ribbed across and vary much in colour. Some are dark reddish-brown, others light pink, others, again, almost white, with even a slight yellow tint.

Sometimes most of the spines lie close to the plant, and one giant one in each branch stands out several inches from all the others. These longest spines are at regular intervals, giving a peculiar individuality to the plant; in fact, you may have a number of these curious plants—no two would resemble each other.

CORRESPONDENCE.

To the Editor of the CACTUS JOURNAL.

DEAR SIR,—It is with great pleasure that I received the last number of the CACTUS JOURNAL. The index will be a very useful addition. I have sometimes wondered why the botanical names used in the JOURNAL should have been printed in italics, but it is now clear to me this was done to facilitate reference from number in the index. Again, it is useful to make the reference numbers referring to illustrations distinct from those referring to reading matter only, and that without having a separate list to wade through.

I must congratulate you upon the result of the first year's JOURNAL. Although there are some things that might have been improved, yet a great deal of information and assistance has been given to lovers of Cacti, and I sincerely wish you continued success. No doubt the readers will be much interested and instructed by the information you will gain in your visit to the "*Cactus at home*," in America, and I think we may congratulate the JOURNAL and its readers in possessing an editor who evidently wishes to give such information at first hand, and not only from hearsay.

Wishing you every success in the second year's JOURNAL,

I remain, yours very sincerely,

London. ECHINO.

To the Editor of the CACTUS JOURNAL.

ECHINOCEREUS AMINA ALBA.—This very free flowering little plant is, I think, rare, as I have never heard of it or seen it named in any catalogue. I had a small plant with twelve or thirteen flowers this year. It is not pure white, but more like a very pale *Williamii*, covering the plant, and very nicely scented. I have only two small specimens now, my large plant, with twelve or thirteen heads, I left out of doors, as it had mealy bug, and I could not get them out from between the crowns. It is rather difficult to keep after flowering if not attended to, as it rots very rapidly. J. C.

To the Editor of the CACTUS JOURNAL.

I AM sending you to-day two photographs of curious succulents. The smaller one

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is a form of *Crassula pyramidalis*, from Laingsburg, in the Karoo, cultivated to flower by my excellent friend, Mr. Chalwin, of the Capetown Municipal Garden. I also found it at Matjesfontein, not far away from the former place. If you will turn up to Thunberg's Flora Capensis (Ed. Schultes) you will find a description which fits the plant, as it varies much better than Harvey's description in Fl. Cap., vol. ii., 358. I suspect Harvey had not met with this curious elongated form of growth, but only knew the dwarf thumb-like plant distributed scantily by Ecklin and Zeyler as No. 1863. This last resembles the *upper inch* of the left hand figure, has its leaves packed in close contact, and rarely produces side shoots. You see how loosely the figured plant grows, even to the extent of mimicking *C. lycopodioides* Mr. Chalwin finds that these *Pyramidellæ* mostly die off after flowering. They have done enough for the next generation and retire. I have another still stranger form collected at Matjesfontein, in which there is a central axis bi-tri-furcating upwards, and bearing a little cauliflower-head of flowers at the apex of each sub-division. It will be distributed as an exsiccate in my Centuria XIX., when leisure can be found to allot the dozen sets. But alas, that necessary datum for such work is hard to find here.

The other curio is *Pelargonium crishmifolium*, Sm., and represents the largest plant I have ever seen. The special interest lies in the way the plant defends itself from the chance browzing of the wild bucks and the harmless necessary sheep. After flowering, the peduncles harden and wither at the tips into rather formidable spines, which bristle outwards like a porcupine's quills or a hedgehog's prickles. The tender tissues of the sheep's nose get from them a pointed hint that the succulent stems below are not to be bitten off. This protection is followed exactly in the same way by the very curious *Cotyledon reticulata Th.*, the 3,133 of my distributions, by *Euphorbia hystrix* and others of its section, and also by *Sarcocaulon Patersoni, D.C.* If we did not know that it is the hard conditions of Karoo climate which have induced the establishment of these beneficial variations, one would almost think that one of these plants had copied the other. South Africa is full of what I figuratively call *clever* plants, as it would seem, plants that would seem to have met hardship by adaptation of their organs.

Faithfully yours,
P. MacOwen.

Department of Agriculture, Cape Town.

To the Editor of the Cactus Journal.

Dear Sir,—Allow me to add my testimony to that of others in respect of the merits of your valuable paper. I think it supplies a long-felt want, being useful alike to amateur and professional gardeners who cultivate these quaint and grotesque plants either for pleasure or profit. Apart from their pretty appearance when not in bloom they are at all times lovely and grand, but when in flower, who can describe their charms? Take the *Phyllocactus* for instance; what is prettier than *Albus Superbus* when covered with a mantle of almost snow-white blossoms? or *Peacockii*, whose flowers glisten and scintillate in the sun, showing all the colours of the rainbow with dazzling brightness? Then we have *Cooperi* and *Pfersdorffi* with their garments of golden blossoms, making a picture that would put an R. A. to shame. I am glad that such a work as your Journal has been started, for it has proved useful to me in many ways, and I know it has to others, and I trust it will continue in the way it has begun, and then it is bound to be a success.

Walkden. J. H.

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LIST OF PRIZES WE OFFER FOR PHOTOGRAPHS.

CONDITIONS.—1. No entrance fee will be charged, but the competitor must be an *annual* subscriber to the CACTUS JOURNAL, starting from February, 1899, and the subscription (6s.) must be sent direct to the EDITOR, care of Mr. E. W. Allen, 4, Ave Maria Lane, London.

2. Any competitor can enter for any or all the prizes, but not more than two will be awarded to any one. If by chance more should be won by one competitor, the two of highest value will be sent him, and the next in order of merit will receive the prize or prizes for the other classes.

3. All competitors must send in notice of their intention to compete, and also the number of the classes, on or before May 1. If by any chance only a very few enter for any class or classes, notice will be given in the May number of the JOURNAL that that class will be withdrawn. If, on the contrary, a large number enter for any special class, then a second, and even a third, prize will be given.

4. The photographs must be taken in the year 1899, from plants belonging to the competitor, and a statement to that effect must accompany each entry, signed by the competitor, except in classes 12 and 13.

5. The judging will be conducted with strict impartiality. The photographs, etc., sent in will become the property of the CACTUS JOURNAL, and will be exhibited in London, and possibly in other large towns afterwards.

6. All photographs must be sent in not later than July 30, and the prizes will be awarded and sent as soon after that date as possible, a list being published in the August, or at latest September, number of the JOURNAL.

CLASSES.

CLASS 1. A prize value £2 is offered for the best photograph of the interior of a succulent house. Any plant not either a Cactus or an allied succulent appearing on the photograph will disqualify it.

CLASS 2. A prize value £2 is offered for photograph of the best collection of Cacti and allied succulent plants. Only *one* plant of each kind must appear, and a list of names must be sent in with the photograph. Special attention will be given to the rareness, number of plants, size, and condition.

CLASS 3. A prize value £2 is offered for the best photograph of six Cacti, either in or out of flower. One plant of each of six distinct genera must appear. Condition, rarity, and size will be taken into consideration.

CLASS 4. A prize value £2 is offered for a photograph of the best six succulent plants, one only of each genera, from any of the following:—*Agave*, *Aloe*, *Apicra*, *Cotyledon*, *Crassula*, *Dasylirion*, *Echeveria*, *Euphorbia*, *Gasteria*, *Kleinia*, *Mesembryanthemum*, *Sanseviera*, *Sempervivum*, *Stapelia*, and *Yucca*. General effect, also individual rareness and condition, will be noted.

CLASS 5. A prize value £1 is offered for a photograph of the best six Cacti, in or out of flower, distinct, none to exceed 1 foot high. Size of photograph not to exceed 6½ by 4¾ inches or a half plate.

CLASS 6. A prize value £1 is offered for a photograph of the best *Phyllocactus* or *Cerei* in flower. Photograph not to exceed a full plate, or 8½ inches by 6½ inches. Number and size of flowers, condition of plant, and general effect will be considered.

CLASS 7. A prize value £1 is offered for the photograph of the best Cactus, in or out of flower. Condition and rarity to be considered in preference to other qualities. Size of photograph not to exceed 6½ by 4¾ inches.

CLASS 8. A prize value £1 is offered for a photograph of the best 12 miniature Cacti, all different, no plant to exceed 4 inches in height, measured from the soil. Condition and rarity specially considered.

CLASS 9. A prize value £1 10s. is offered for photograph of the best arrangement of Cacti and allied succulents, for room or table decoration; all plants must be planted in one receptacle. Special note will be taken of condition, variety, and general effect. Size of photograph not to exceed 8½ by 6½ inches.

CLASS 10. A prize of £2 is offered for photograph of the best collection of Cacti and allied succulents, bedded out in the garden. General effect will be the main point considered. Photograph not to exceed 12 inches by 10 inches.

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CLASS 11. A prize of £2 is offered for photograph of best outdoor Cactus and succulent rockery. No other plants must appear. General effect will be the principal point. Size of photograph not to exceed 12 inches by 10 inches.

CLASS 12. A special prize, value £2, is offered for the best photograph, any size, from any part of the world, of Cacti or allied succulent plants, growing wild in their native habitat. *Non-subscribers may enter for this.*

CLASS 13. A special prize, value £2 is also offered for the best coloured drawing of a Cactus in flower; any size. *Non-subscribers may enter for this.*

CLASS 14. A special prize value £2 is offered for photograph of the best-looking Plantarium, filled with Cacti and succulent plants. Any form of Plantarium may be represented.

CLASS 15. A prize value £2 is offered for the best photograph of a collection of Cacti or succulent plants, *growing in a window.* We anticipate a large number of entries for this, and will give a second and third prize if the numbers warrant it.

DISCOURAGEMENTS.

WE all have them. Did you ever have a choice plant, caring for it, waiting for it to bloom, and after it had expanded a few of its lovely flowers, suddenly discover that the body of the plant was a mere shell in a state of collapse?

Did you ever find any of your specimen *cerei* or *opuntias* decayed at the base, while the upper portions appeared to be growing vigorously? Did you ever find that some of your *phyllocacti* were liberally sprinkled with a sawdust-like powder, and on closer inspection find them covered with scale? or find that some of your finest *mammillarias* had been taken possession of by a colony of mealy bugs?

One cold, windy night a few years ago, the fire in my plant room went out, and a sorry looking lot of plants were mine. Though the temperature was not down to freezing, the wind had blown in around the windows and cut the life out of *cerei*, *aloes*, *opuntias*, and *crassulas* for about six inches at the base of the plants. Had a nice lot of cuttings. Some plants I lost outright, among them one *Aloe arborescens* two feet high, and a large *Crassula arborea* about the same size.

Specimens that decay at the base should be taken from the pots, the decayed portion removed by cutting with a sharp knife up to where the growth is sound. Cut off enough. Dust the freshly-cut surface with powdered charcoal, wood ashes, dry loam or fine sand. Lay in the sun to dry a few days, then plant in new soil. But of all the discouragements, I believe the worst is bugs. Eternal vigilance is the price of freedom from insect pests, mealy bugs, snails, scale, ants, spiders, etc. It is a very easy matter to care for a dozen or two plants, for they are not much troubled by insect foes, but when your collection grows up into the hundreds it is another thing.

Of them all, I think the scale is the worst, but have not been troubled a great deal with it, chiefly on some *phyllocacti* and *epiphyllums*. The mealy bug has been more plentiful; both are most troublesome toward spring. Have lost no plants by either yet. To exterminate them I have used kerosene, naphtha, kerosene emulsion, alcohol, ammonia, and have been successful with each. Ammonia I cannot recommend. Alcohol is probably the best, but may not be always at hand as some of the others are.

A few weeks ago a friend was showing me an *echinocactus* that he said was covered with mealy bugs. I did not see them on account of a powder that was put on to kill them. Supposed it was hellebore, but he said it was some kind of washing powder that his wife put on. Presume the mealy bugs are dead--the *echinocactus* is.

If the plants are badly infested, they should be potted in new soil, the pots being cleansed, as sometimes the old soil contains some of the insects that will quickly locate upon the plants again.

After all, these discouragements only tend to make us more successful in the care of our plants, for we gain valuable experience, if we have the patience, and are not easily discouraged in well-doing.

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CEREUSES AND THEIR CULTURE.

UNDER this head are comprised a numerous section of the Cactus family, amongst which are some of the most gorgeous-blooming subjects in the whole range of flowering plants, at one time very much more cultivated than now. In times past, when hothouses were mostly warmed by the old-fashioned flues with the dry heat they gave off, the genus Cactus was largely represented. True, the flowers individually do not last so long as some others, but when the plants get large they give a succession that keeps on for several weeks. The splendid colours possessed by many of the varieties, comprising the most vivid shades of red and violet, are unequalled in the whole range of cultivated plants. Cereuses are of the easiest possible growth, provided that a few essentials to their well-being are kept in view, requiring very little of that watchful attention which many newer and more fashionable introductions demand.

They propagate freely from cuttings made of good-sized pieces of the shoots after they are fully matured; these should consist of a considerable portion of the preceding season's growth. If taken off in the spring they should be laid on a dry shelf for a few days, to allow the base, where severed, to dry up, after which put them singly into thoroughly-drained pots just big enough to hold them, filled with sandy loam; set them in a stove temperature, but not shaded or kept close in the way most cuttings require to be, or the result would be that they would rot upwards from the base; neither must they have much water until they have made plenty of roots; just as much as will prevent the soil getting quite dry will suffice. After they are rooted, keep them near the glass, with all the sunlight available, and also where they will get air daily. A less moist atmosphere suits them better than that of a modern plant stove. When they have begun to grow, put a stick to each to support them, giving water now more freely. If the cuttings have, in the first instance, been put in 4-inch or 5-inch pots, these will be large enough for the first year, as they do not like too much root room. Towards the end of September gradually withhold water, keeping them quite dry through the winter, during which a temperature of from 48 to 50 degs. will answer.

In the spring, about the end of March, cut a small piece off the head of each to help them to break out additional shoots. This may not be necessary with all the sorts, as some will branch freely of their own accord, but in no case have I found stopping the points do any harm. Increase the temperature as the days lengthen, giving a little water at first, and when the shoots have got plump, and growth has fully set in, give more; then move them into larger pots, proportionate in size to that of the plants, according to the strength of habit in the particular kind. Use a moderate quantity of sand, and some potsherds broken small will help to ensure porosity. Continue to treat them as advised during the preceding summer, with plenty of heat and sunlight in the growing season; again dry them off in the autumn and winter as before. Some of the smaller freest-flowering kinds will yield a few blooms the ensuing summer. The management afterwards required will be of a simple routine character, giving more pot room as the roots need it, but being mindful never to overdo them in this respect. As the plants get large, which they will in the course of years, with the less heat-requiring kinds it will be an advantage to stand them out during July and August in the open air against a wall in the full sun, giving no more water than is required to keep them from shrivelling; so treated, they will go on and last for many years. Such species as *C. McDonaldiæ* and *grandiflorus*, the night-blooming Cactuses, require to be trained to a wall exposed to the full sun in a warm stove, as they need a thorough ripening to enable them to bloom. In addition to the above two species—the former of which comes from Honduras, and has yellow flowers; the latter from Jamaica, and bears white flowers of immense size—the undermentioned are all fine kinds:—*C. speciosissimus.*—Crimson. From South America. *C. flagelliformis*; this often succeeds well in a window.—Pink. From Peru. *C. splendidus.*—Scarlet. From Mexico. *C. triangularis.* White. From the West Indies. *C. Tweedlei.*

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—Orange. From Buenos Ayres. *C. superbus.*—Red. Mexico.

Some of the above will succeed with a lower temperature than that of the stove, but all are benefited by considerable heat whilst growing. There are a very large number of known species, but those named will in most cases be found a sufficient selection for ordinary cultivation.

SOUTH CALIFORNIA CACTI.

E. viridescens is found round San Diego for a distance of ten or twelve miles, usually in heavy "adobe" soils, what is called clay soil in the East, where there is no rain from the latter part of March or early in April until November or later. The ground becomes almost as hard as rock. During the winter there is from six to twelve inches of rain, the average being about ten. *C. Emoryi* grows in very sandy soil, under same conditions as regards moisture. I have *viridescens* planted with other Cacti in soil composed of decomposed granite gravel, with some very old, well-rotted manure, and they thrive beautifully. They are at the end of a long bed, and perhaps do not get quite as much water as the rest of the bed through the summer. *C. Emoryi* does not do as well in beds with other plants, and so I conclude they are better handled by themselves. They need very sandy soil and care in watering, and both of these varieties must have sufficient drainage. I think if I grew them in pots I would give them water from May till October only when they showed positive need of it. *Viridescens* will begin to turn yellow when too dry, and *Emoryi* will look a little crinkled; then give a good thorough soaking and wait till they show signs of need before giving more. From October through the winter they amply repay for their care. Keep in the hottest sun and give all water they need, and *viridescens* will show beautiful spines, while the golden colour of *Emoryi* and the velvety look of the new growth will light up a collection of plants wonderfully. Of course, plants in pots require much more water than those growing in the ground. Where these plants are found in their native habitat there is a great deal of fog and a damp atmosphere, but at my mountain home the atmosphere is very dry, and fog in the summer is very uncommon; still they thrive well under the conditions I have named.

I wish the admirers or Cacti could visit with me some of the fine collections in this city. One collection I visited has the most perfect plants I have ever seen. *C. Pringlei*, ten feet tall, had bloomed the day before, and the closed-up flowers were still on the plant. I think *Pringlei* very desirable where there is room for large specimens—much more so than *giganteus*, as it blooms sooner, and the blossoms are down the sides of the plant, while the blossoms on *giganteus* are at the top. I saw surprised at the beauty of *Astrophytum Myriostigma* when large, and they are such profuse bloomers. *C. triangularis* had dozens of buds, and will be a thing of beauty for months. There were other very beautiful plants, but the owner was not at home, and his wife did not know the names, so I could not learn what they are. *M. bicolor* is a beauty, and a very desirable plant. Another collection has beautiful specimens of *Echinoc-Wislizeni*, *Emoryi cylindricus*, *Visnaga horizonthalonius*. Some of them are two feet tall, and as large through. This collection are all in pots, and the specimens are the largest I have seen. Some of the *cristates* are also very beautiful. In this city we see *phyllos* and all *cereus* planted in the open ground, and running up sometimes ten feet or more. A *Cereus nyclicalus* covers a fence ten feet long and three feet tall. Grafts are put in without taking the plants out of the ground; sometimes a piece of muslin is fastened over them to keep off the sun for a few days. *C. Spachianus* is one of the prettiest plants I have seen in any collection. *C. Peruvianus* is another one that is desirable, and has a distinct look of its own.

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* All the advertisers to whom this * is affixed are either members of the National Cactus Society, or are personally known by the Editor to be of good repute. Strangers wishing this * added to their advertisements must furnish two names of professional men (who will vouch for their respectability) accompanied by 1s., in P.O., or stamps, for trouble and expense of enquiry.

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[A charge of 1d. for each three words or portion of three words is made in *Exchange*, *Wanted*, or *Sale* columns. A number or initial may be used at a cost of 2d. extra. All letters in answer in that case must contain a 1d. stamp, and addressed under cover to the Editor, who will forward them.]

WANTED, good plants of the following Pilocereus:—Celsianus (forcolatus), Columna Trajani, Fulviceps, Gounelii, Haagei, Niger, Curtisii, Polyptichus, Scoparius, Strictus, Subintortus. Williamsii. Address, with size and price, Charles Darrah, Heaton Mersey, near Manchester.

WANTED, Cactus seeds, in bulk, send list and price. F. A. Walton, Handsworth, Birmingham.*

WANTED, young plants of *Pilocereus Dautwitzii* also *Dautwitzii cristatus*. Send full particulars. W. 21.*

WANTED, to correspond with collectors and amateurs in Texas, Arizona, California, or Mexico, who have Cacti for disposal. I shall be in those States during January, February, and March, and any letters directed to me at the post offices of the following towns, will be at once attended to—Laredo, Eagle Pass, El Passo, Tucson, San Bernadino, Mojavi, or San Diago. F. A. Walton, Handsworth Wood, Birmingham, England.

WANTED, to correspond with collectors or dealers in Central or South America who have some knowledge of Cacti. Shall be glad if any reader can give me the names and addresses of anyone who would be likely to correspond with a view to business. Walton, Handsworth Wood, Birmingham.*

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Will exchange Cacti or Succulent plants with anyone. Have fairly good collection. Send list of your duplicates and requirements. E. 132.*

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EPIPHYLLUMS, grafted, good bushy plants covered with buds, from 2s. 6d. to 5s. each. *Rocheas*, *Sempervivums*, *Kleinias*, *Stapelias*, *Yuccas*, and other succulent plants in great variety. List and price on application.

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The Cactus Journal.

Vol. II. No. 14. MARCH, 1899. Price Sixpence.

EDITORIAL.

We write this in America, the native home of the Cactaceæ.

***

Professor William Trelease, of the Missouri Botanical Gardens, and Dr. A. A. Kleinschmidt, President of the St. Louis Cactus Society, having placed their valuable collections of plants and works on succulent plants at our disposal during our stay at St. Louis, and also introduced us to all the members of the St. Louis Cactus Society having anything very special in the succulent plant way, we have been enabled to take many valuable notes and photographs, that will appear in the Cactus Journal from time to time, as opportunity occurs. We have also made arrangements with several gentlemen at St. Louis to contribute papers upon their special subjects.

***

Professor Trelease also very kindly lent us some beautiful half-tone blocks, some of which will be used to illustrate a paper written by Mr. Guerney, upon the American Agaves.

***

We take this opportunity of thanking Professor Trelease, Dr. Kleinschmidt, and all our many friends at St. Louis, for their kindness and courtesy to us during our stay. We expected to be among strangers, instead of which we found none but friends.

***

Would the authorities at, say Kew Gardens, treat an American in like manner? We trust so, for the credit of the old country.

We shall in various papers give accounts of some of the collections we saw, also an account of the Botanical Gardens, with illustrations taken upon the spot.

***

There are a number of Cactus growers at St. Louis, some having very fine plants indeed, one gentleman showing us a photograph of a *Cereus Triangularis*, with seventy-six flowers out at one time. The plant was growing against his greenhouse; but we will take an opportunity of writing more fully of this another time.

***

It has been a source of great interest to us to see the native habitat of the Cacti, and will enable us to give much more authentic information respecting the culture of these interesting plants.

***

We have not yet received any photographs of Cacti for competition as described in our last number, and shall be glad to send any particulars respecting the competition to any inquirers.

***

We are glad to say that each month we receive some new subscriptions, so that we feel convinced that our Journal is appreciated by the lovers of Cacti.

***

Annual Subscriptions now being due, we shall be glad if subscribers will please send remittance as early as possible to *The Editor*, care of Mr. E. W. Allen, 4, Ave Maria Lane, London.

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CEREUS FLAGELLIFORMIS CRISTATUS.

Of all the marvels of the many marvellous forms of the Cactus family, perhaps *Cereus flagelliformis cristatus* is the greatest. The accompanying illustration will show, better than anything that can possibly be written, what extreme variety of form these plants take; but yet even this illustration hardly does justice to this interesting plant. In California it is very popular.

There it is usually grafted upon *Cereus colubrinus*, usually from eighteen inches to four feet high. One plant I saw especially struck me, it was at San Diego, and grown by a coloured man (negro) who had a great love for *Cacti*. This plant was about three feet high, had a large number of branches coming from the head; they were all round, for about a foot in length, and then spread out in intricate convolutions; some were almost fan-shaped, and, say, eight inches wide, others were bent and twisted in every direction, and had long tail-like growths hanging from them. I succeeded in making an exchange with him for this plant, but expect the journey to England will be too much for its delicate branches, although it was carefully packed by the grower, who treated it with great tenderness. He is a great lover of *Cacti* and one of the most successful growers in the town of San Diego.

If this plant is grown upon the rapid-growing *Cereus colubrinus*, for a stock, it quickly forms a good large head, but, this head is not so permanent as if a stock of a harder nature had been used.

Some good plants are grafted upon *Cereus grandiflorus*, but this is rather too thin for a really large head.

Cereus triangularis, if a straight branch

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be rooted, would probably form a much better stock. It would be more permanent than *colubrinus*, and much thicker than *grandiflorus*, besides being a large-rooting variety, forming plenty of sap to support its graft.

Cereus speciosissimus makes a splendid stock, especially if the four angles, together with its rather obnoxious spines, be removed with a sharp knife. I have seen this used with great success as a stock for grafting *Epiphyllums*. I shall certainly try some of the larger-growing *Cerei*, such as *Peruvianus*, *gemmatus*, or other tall columnar kinds, and insert grafts of *flagelliformis cristatus*, at intervals of, say, six inches, right from the top to the bottom. No doubt in a very short time some handsome specimens would be formed. This would also be a very good way of utilizing old stumps that have become disfigured, but, being well rooted, we do not wish to throw away.

One good point about *Cereus flagelliformis cristatus* is its fine blooming capacity. The flowers are sometimes formed in clusters, being in that case somewhat smaller than the uncrested type, but very beautiful. One of its best points is its rapidity of growth. Another is its constantly changing form; for a plant will so alter in one month of its growing period, as to be quite unrecognisable. This is owing to the flexibility of the broadened, fan-like, flattened branches. They like plenty of moisture both in atmosphere and at the roots during growing season, also pretty well of heat; if these be accorded you will be surprised and satisfied by their rapid development.

One other point. Do not be discouraged if you see the plant forming numbers of straight, long, normal growths, for they will eventually commence to spread out into the crested form. If a dwarf-crested plant is required, one of the crested ends should be cut off, and grafted upon a short, healthy stock, say three inches high, forming at once a very handsome, if small, specimen.

F. A. Walton.

THE SUCCULENT PLANTS OF THE BRITISH ISLANDS.

Although there are no arid plains or desert tracts in these islands, yet succulent plants are not entirely unrepresented in the British flora. In dry situations, such as upon rocks and walls and the sides of hedgebanks, and upon the cliffs and sandy stretches by the seashore, the seeker of our wild succulent plants must pursue his search.

It has been experimentally proved that when the conditions of a plant's surroundings are changed a corresponding change takes place in the form of the plant. It may therefore be assumed that the form of a plant is largely due to the surrounding conditions of its growth. Among other changes induced by the cultivation of certain plants in places near the sea is the development of a certain fleshiness of stem and leaf, while if these same plants be grown in soil with only a small amount of salt in it, the stem and leaves are thin. Thus it is evident that among other causes regulating the thickness of the leaves is the amount of salt contained in the soil. It seems that the presence of large quantities of salt in the soil induces the formation of a thick cuticle, which in its turn causes the retention of water and the greater development of tissue capable of containing the water which is thus stored away.* Again, in the case of rock plants, succulence is induced by the necessity of storing water, for these plants are exposed to the scorching rays of the summer sun which beat fiercely down, even in our climate, upon the plants struggling for existence on the bare face of the rock; dry winds, too, tend to cause the loss of much moisture.

Among plants of a succulent habit which grow on sea coasts in these islands may be mentioned *Cochlearia officinalis*, *C. anglica*, *Crambe maritima* (Nat. Ord. Cruciferæ); *Lotus corniculatus*, *var. crassifolius* (Nat. Ord. Leguminosæ); *Matricaria inodora*, *var. salina*. *M. maritima*, *Aster Tripolium* (Nat. Ord. Compositæ); *Solanum dulcamara*, *var. marinum* (Nat. Ord. Solanaceæ); *Polygonum aviculare*, *var. littorale*, and the more fleshy species, *P. maritimum* (Nat. Ord. Polygonaceæ); *Salsola Kali* (Saltwort), *Beta maritima* (Beet), *Salicornia herbacea*

* Orig. of Plant Struc., p. 49.

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and *Sueda fruticosa* (Nat. Ord. Chenopodiaceæ); *Crithmum maritimum* (Nat. Ord. Umbelliferæ).

In the foregoing list it will be noticed that in several species there are natural seaside-growing varieties exhibiting a succulent habit, the same species growing under more ordinary conditions have thin leaves; such is the case in *Lotus corniculotus*, *Matricaria inodora*, *Polygonum aviculare*, etc.; and these natural examples only confirm the principle stated above, and which has been experimentally proved, that saltness of the soil induces succulence. It is stated that even so typically succulent a plant as *Crithmum maritimum*, the common samphire, produces, when grown in ordinary soil and away from the sea, thin leaves and stem instead of the extraordinarily thick leaves produced in its native home.

But in addition to these there are several representatives of that typically succulent family, the Crassulaceæ. It is probable that these are the plants which would be cultivated if any one desired a small collection of succulent British plants. The family is represented in this country by four genera, viz., *Tillæa*, *Cotyledon*, *Sedum* and *Sempervivum*, the last named, although not indigenous, yet widely distributed in these islands.

The genus *Tillæa* is represented by *Tillæa muscosa*, a very minute plant growing on sandy heaths in a few places in the southern counties of England. The reddish stems are only about 1 in. or 2 in. long, and are covered with minute fleshy leaves, while the minute white flowers are borne along the whole length of the stem.

The next genus, *Cotyledon*, is represented by the well-known Pennywort, or Navelwort, *C. umbilicus*, an extremely succulent species very common on rocks and walls in most of the western counties of Great Britain, but not found in the eastern counties at all; it also occurs in Ireland. The plant has a tuberous rootstock, from which spring fleshy, orbicular, glossy green leaves, and in June or July a stem about 6 in. high, bearing green flowers, and occasionally small leaves.

The common house leek, *Sempervivum tectorum* is the only representative of the rather large genus, *Sempervivum*, many species of which, natives of N. Africa or the Himalaya, are cultivated in rock gardens. This well-known plant occurs usually upon the tops of walls or roofs of houses, and forms globose tufts of fleshy leaves, from which springs a tall, leafy flowering stem in June or July, bearing a number of dull, red-purple flowers. The leaves are green, edged with purple. The generic name is given in allusion to the plant's great vitality.

The remaining genus, *Sedum*, has several British representatives, and is usually divided into three groups according to the duration of the plant and the shape of the leaves:—

1. Telephium. Perennial. Leaves flat or concave. Stem annual.

2. Cepæa. Annual or biennial. Stem simple. Leaves subcylindric.

3. Sedum proper. Perennial. Stem branched. Leaves subcylindric.

The species with flat leaves are *S. Rhodiola* (Rose root), and *S. Telephium*, the Orpine. The first-named, which has a thick root stock having a scent of roses, is found on mountain rocks in Wales and Scotland, and in Ireland; the flowers form a compact, flattish, yellow or purple head, borne upon a fleshy, leafy stem 6-18 in. high. *S. Telephium* grows here and there upon stony hedgebanks and in copses, etc. The flowers are rosy white or speckled, and the stems sometimes reach a height of 2 ft.

S. villosum, the single representative in these islands of the second section, grows in boggy land in the hilly parts of Yorkshire and other northern counties, and in some parts of Scotland. The leaves are small and the stem, at most 6 in. long, bears at its apex in the second year a few white or purplish flowers about an inch in diameter.

S. album, *S. anglicum*, and *S. dasyphyllum*, the last, not indigenous, belonging to the third section, have white flowers, while *S. acre*, *S. sexangulare*, *S. rupestre*, *S. Fosterianum*, and *S. reflexum*, yellow ones.

S. album grows on the Malvern Hills, and in a few other parts of England and south Scotland. *S. anglicum* is much smaller, and common on hills and rocks and hedgebands, especially near the sea, forming matted tufts of a green or reddish green colour. *S. dasyphyllum* occurs rarely on old walls.

S. acre is too well known to need description; it is found on old walls, rocks, and so on, and is the Biting Stonecrop or Wall-pepper of the countryman. *S. sexangulare*, *S. rupestre* and *S.*

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Fosterianum, are all rare species, the first being found on old walls in E. England; the second on Cheddar cliffs and in a few other places; the third on wet rocks in some of the western counties, and in Wales.

S. reflexum occurs in many parts of England, on walls and rocks. It is rather a large species, bearing conspicuous yellow flowers on the end of long curved stems.

Leyton. FRED. J. CHITTENDEN

SPRING NOTES.

BY AN AMATEUR ENTHUSIAST.

CACTUS lovers will now begin to turn their eager attention to the delights of the greenhouse as exhibited in the commencing growth of their "pets," which (now that the warm sun is beginning to make its influence felt) is daily becoming more noticeable. There are the charming tints of the newly-born spines, and the certainty of some, and the possibility of other, species flowering in the near future, to gladden the spirit of the amateur. In my own greenhouse numerous plants are beginning to show their bloom, and from the many tiny buds pushing their way through the interlacing spines, on some of the thimble *Mammallarias*, to a promise of a more gorgeous show from the genus *Phyllocactus*, among others, everything points to the advance of Spring and the coming of Summer, when the great beauty of these plants—the *Succulenti*—will continue to compel our interest and wonder at the gradual development of Nature's marvellous handiwork.

It is very true of the man who rides the Cactus hobby, that he never enters his greenhouse without making some fresh discovery, and as regards myself, the remark is very apt. Who, for instance, can look without pleasure and wonder at the structure and beautiful colouring of the spines on *Echinocactus Grusoni*, and especially in the centre, where the deep golden spines arise out of their woolly bed? And again we are struck by the delicacy of the coloured spines—the true geometry of nature; and the spotless white of the little tufts of wool of *Mammallaria Cirrhifera*. These are only instances which one might perpetuate endlessly; but at no time, to my thinking, is the beauty of the Cactus more apparent and refreshing than at the commencement of its season's growth, in the Spring.

The watering-pot now becomes a prominent feature once more, and, *inter alia*, the sooner our compost is prepared for the potting that will shortly be necessary, the better.

With regard to the composition of the latter, it seems to be a case of "many men, many minds," but my own practice (which I have found to answer very well) is to mix a little more than a third each of rich loam and coarse silver sand, and a little less than a third of leaf mould together, and add thereto a small quantity of brick pounded up to the size of peas It is very essential to notice that the leaf mould is quite sweet before using, as it has an unpleasant inclination to become sour and stale when left for any time in a place where its own moisture is confined.

Although I have found the above to answer very well with me, I am fully aware that it differs from the ideas of many growers, and if any fellow amateur will kindly offer their suggestions for bettering it, and quote the reasons why, I feel sure that the Editor, with his usual courtesy, will be glad to find space therefor.

This does not, however, exhaust the subject. There is still the vexed question of manure to be considered, and although I do not use this with my plants, I may be wrong, and if some of our readers would let me and others hear their minds on the subject, I for one should be pleased, and I fancy it is a point that might be made instructive to many

I have heard that the addition of manure to the soil renders sappy growth and winter "rot" an unhappy probability, but I can certainly say that I have not hitherto been troubled with either enemy —which I have put down to the non-use of manure—and my own way of thinking is, that it is an undesirable quantity, especially when one can only command a low winter temperature, as in my case.

Perhaps the Editor might find space for a few remarks on this subject also.

Leyton, Essex, April 6th, 1899.

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A SUCCULENT TOUR TO LOWER CALIFORNIA.

By Dr. C. A. Purpus.

It was a splendid evening in December, such as one only sees in Southern California, when I embarked on the schooner "Wahlberg" for a trip to Magdalena Bay, in the southern part of the peninsula. A light fog lay over the bay of San Diego, hiding the greatest part of the town from our view. Slowly, and scarcely perceptibly, we sailed until we came to the entrance of the bay, below Point Soma, a headland having a light-house on its highest point. The sea now becoming rough, together with the swing of the boat, caused me to retire for two days to my cabin with an attack of *mal de mer*.

After a few days' journey we landed in the wild bay of Ensenada de Todos Santos, the chief town in Lower California, and which has an incomparable position. In the east rise steep mountains covered with bushes, and their summits crowned with a species of pine, probably Pinus Parryana Engelm. To the right extends an undulating plain with a long stretch of hills which half encircles the bay. I landed in a small boat, and there, for the first time, and close to the shore, made acquaintance with the succulents of Lower California. I found between the rocks *Cereus gummosus, Engelm, Opuntia, Engelmannii, var. littoralis Engelm*, also farther on *Echeveria attenuata* and *Echeveria edulis*.

In the mountains east of Ensenada, according to T. S. Brandegee, you find *Cereus phæniceus var. pacifica Engelm*. To my sorrow I had no time to collect any, only staying there one day. The gardens of the town were full of *Opuntia tuna L.*, also splendid palms and banana trees, which gave it a charming tropical appearance.

In the evening we sailed out of the bay towards the south. The sea being quieter and the wind favourable, we soon came in sight of the small island San Martin, where we landed for fuel. The island is a long-extinct crater, rising in a steep black pile about 500 ft. above the sea level. The furrowed slopes of the crater, with its deep holes and clefts, are covered with an almost impenetrable growth, mostly *Euphorbia misera Benth*, but in some of the rents of the rock grow a beautiful red-spined form of *Ects. Emoryi Engelm*. Farther on, in thick clumps, we found *Echinocereus maritimus M. S. Jones*; lastly, the small *Mammillaria Goodridgei, Scheer*, and an *Echeveria*, probably the new *Echeveria Unthonyi Rose*. Besides these Mr. Brandegee found *Cereu Cochal Orcutt*, and *Mesembrianthemum crystallinum L.* Upon the cliffs of the island were masses of seals, whose wild cries sounded far over the sea.

We returned on board after a short stay on the island, and soon came in view of the small sandy island San Geronimo, the breeding place of numerous sea birds, and which, according to Mr. Brandegee, only contains one succulent, *Mesembrianthemum crystallinum L.*, altogether only four different *Phanerogams*. We sailed from here along the coast, the picturesque indented chain of mountains looking a deep blue under the southern sky. Presently there arose a violent north wind, which drove the ship out of her course, and in the direction of the Cedros Islands. We anchored in the evening in the Bay of Santi Domingo, which is in the middle part of the peninsula. The next morning we made the sorrowful discovery that the anchor had given way and that we were in the breakers. The waves rushed over the boat and we feared for the masts. Myself, with a Mexican passenger, made for the shore in a boat, and having found a deserted hut made it our quarters for the night; the sailors, wading through the sea, brought us the next morning some provisions. The coyotes were so numerous and bold that we were obliged to watch for several nights to insure safety.

One day, northward from the hut, I climbed an extinct crater, called Lagoon Head, and viewed the landscape around, which presented a very sandy appearance, and was covered in certain places with *Yuccas* and shrubs. Towards the east was a dark volcanic chain of mountains extending far to the south. Towards the

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west rose the rocky island, Cedros or Cerros, above the blue waves of the sea; and quite in the south-west a picturesque mountain chain stretched far into the sea—it was the uninvestigable Santa Clara Berge. I found here in the sand an interesting *Ects.*, with short (somewhat crooked) reddish-grey spines, growing singly or in small clumps. I brought about forty pieces to San Diego. Mrs. Katherine Brandegee considers it to be a form of *Ects. Orcuttii*, but Mr. Orcutt himself, in his new work, which he calls the "Review of the Cactaceæ of the United States," maintains that it is *Ects. Fordii*, because he received it from a man named Ford; however, I leave the decision to the Editor after he has seen it. Farther on in the interior, *Cereus Sargentianus Orc.*, which is, however, only a form of *Cereus Schottii Engelm.*, grows very abundantly, about 3 ft. high, but only occurring in single plants. In the rocks were masses of *Cereus gummosus Engelm.*, and which I also found in clean, sandy ground. This not very attractive *Cereus* is the most common in the peninsula. Here and there I noticed a specimen of *Mammillaria Goodridgei Scheer*, missing, however, *Mammillaria dioica, K.B.*, which I found grew in quantities farther inland. Besides the Cacti, the sides of the mountains were covered, in some places, with thorny, leafless shrubs, bearing fiery red blooms, *Fouquieria spinosa Torr.*, also, *Euphorbia misera, Benth.*, a *Malvacee*, and *Jatropha canescens, Mull.* After staying a fortnight in this unattractive district, I went on into the interior, and after two days reached Calmalli, a small mining town belonging to an English company, but the mines seem nearly exhausted. The first part of the way was through a monotonous, flat, sandy district, covered in some parts with forests of *Yucca valida, Brand*, between which appeared thickets of *Cereus gummosus*. After a while I came across groups of *Cereus Sargentianus, Orc.*, and also an *Opuntia* quite unknown to me, with hideously barbed, strong, white-banded spines. Occasionally I saw a single specimen of *Cereus Pringlei Wats.*, varying in size. Amongst the bushes *Mammillaria dioica Brand*, appeared in great quantities.

In the evening we reached the water station, "Borenda," which has several dwelling places besides "wells," where we stayed the night, continuing our journey to Calmalli the next morning in spite of the intense cold. The vegetation remains the same for a long time here. I saw here and there a single *Ects.* from 2 to 3 feet, probably *Ects. Emorgi, var. rectispina.* I was sorry that I could not inspect them more closely.

On reaching the first chain of hills, we found the character of the land entirely changed Before us rose dark basaltic mountains intersected with arroyos, (dried river beds). The ground and mountain slopes were covered with masses of Cacti, and towering above all was the gigantic *Cereus Pringlei, Wats.*, from 40 to 50 feet, looking like immense candlesticks. *Cereus gummosus, Engelm.* in company with various *Opuntias* form an impenetrable thicket, called by the Mexicans, "Chollas." There were also *Cereus Sargentianus*, the supposed *Ect. Emoryi var. rectispina*, and a magnificient Agave, probably *Agave Applanata var. Parryi Engelm.*

(To be continued.)

NEW BOOK ON CACTI.

Professor Dr. Karl Schumann's latest and most complete work on Cacti, which has been in course of publication in parts, at somewhat irregular intervals, during the last three years, has finally attained the proportions of a perfect volume. It is almost superfluous to say that it fully maintains the reputation of the author as an accomplished writer and teacher. The title of the work is "Gesamtbeschreibung der Kakteen," (*Monographia Cactacearum*). It is a handsome volume of 832 pages, with 109 illustrations. Every known species of Cactus is fully described, and the list of synonyms, in some cases an extensive one, contains references to the original works of various authors. The index is a list of upwards of 3,000 names of plants in which the described species, the synonyms, and the popular names are indicated by a difference in type, to facilitate reference. Every page of the book furnishes abundant evidence of laborious investigation in the verification of facts and published statements. It is a standard work of reference for all students and growers of Cacti, and will probably hold that distinguished position for many future years.

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SOME AGAVES OF THE UNITED STATES.

THE Agaves occupy a prominent place amongst the characteristic plants of the hot and arid regions of the American continent. The genus contains a pretty-distinctly marked group, including the largest and tallest of herbaceous plants. Their flowering stalks sometimes rise to the height of forty feet, or even more, and their conspicuous inflorescence renders them objects of great picturesqueness. They are much prized by all who take an interest in the cultivation of plants. Few conservatories or gardens are without them, as they make a most effective decoration for lawns, terraces, rockwork, and pleasure gardens. Their large size, symmetry of form, stately and elegant proportions, were well characterized by Linnaeus when he applied to them the name "Agave": noble, admirable, wonderful. The thick, fleshy leaves of Agaves generally have their broad bases imbricated over one another around a short axis, thus forming a compact tuft with comparatively little evaporating surface. The cuticle is adapted to resist transpiration. Roots and leaves contain large quantities of mucilage, saponin and salts, which hold water in solution with great tenacity, and thus enables the plants to survive through long protracted seasons of dryness, incident to a land of almost perpetual sunshine. Most species are armed with stout spines, marginal prickles, corneous margins, or dry fibrous filaments. These render efficient protection against the attacks of hungry and thirsty animals, who would gladly seize upon their juicy and nutrient substance. Agaves grow slowly in their native habitats, some attain maturity in three or four years, others require ten or fifteen years. Taken from their homes, and placed under new and strange conditions, they seldom make an effort to bloom, and although they respond to care, so rarely are their flowers seen that they have long been called "Century Plants," because of the old idea that they bloom only once in a hundred years. When the period of inflorescence arrives, a great change is observed, the newer leaves are successively smaller and narrower, the central bud thickens, and after a season, shoots upwards with marvellous rapidity. What at first appears like narrow leaves clustered around it, gradually becomes more and more separated by the elongating axis, and are seen to be bracts placed upon it at regular intervals. After the great expenditure of energy displayed in producing flowers, the vitality is usually exhausted. The plants generally send out suckers or offsets, and then quickly die and give place to the next generation, but this, however, is not an invariable rule. The propagation of the Agave is easy and rapid, seeds being produced in great quantities, and, under favourable conditions, readily germinate. The cotyledon is long and narrow, and bears the seed coat at its apex until fully matured.

Agave Palmeri (our plate this month) is used by the natives of Arizona for food, and also for making the liquor "Mescal," fermented and distilled from its juices. It blooms early in July, and matures fruit in September. It propagates itself by offsets and sometimes also by suckers.

Agave Decipiens (our plate this month); this is a very showy and handsome plant, in some places the growth is very luxuriant, its juice is very acrid and is poisonous to the human skin, causing intense irritation.*—Extract from "Report of Missouri Botanical Gardens."

(To be continued.)

NATIONAL CACTUS SOCIETY.

THE Secretary has the pleasure to announce the following ladies and gentlemen have kindly given permission to the members of the N.C.S. to inspect their Collections of Cacti during the months of April, May, June, July, August and September:—Mrs. Chilton, Mrs. Carter, Mrs. Carez, Mr. Lance, Mr. C.A. Blogg, Mr. P. Bodkin, Dr. Dixon, Messrs. H. Cannell and Son, and Mr. F. A Walton. The Collections may be seen from 2 to 5 p.m. Post cards will be sent to members each month, giving date of month and place to visit.

The Secretary hopes that on receipt of card, members will kindly inform him if it is their intention to be one of the visitors on the day named.

Croydon. C. A. BLOGG.

* These two plants were growing in the Missouri Botanical Gardens, St. Louis, and we are indebted to the kindness of the director, Mr. W. Trelease, who has kindly lent us the blocks for reproduction.

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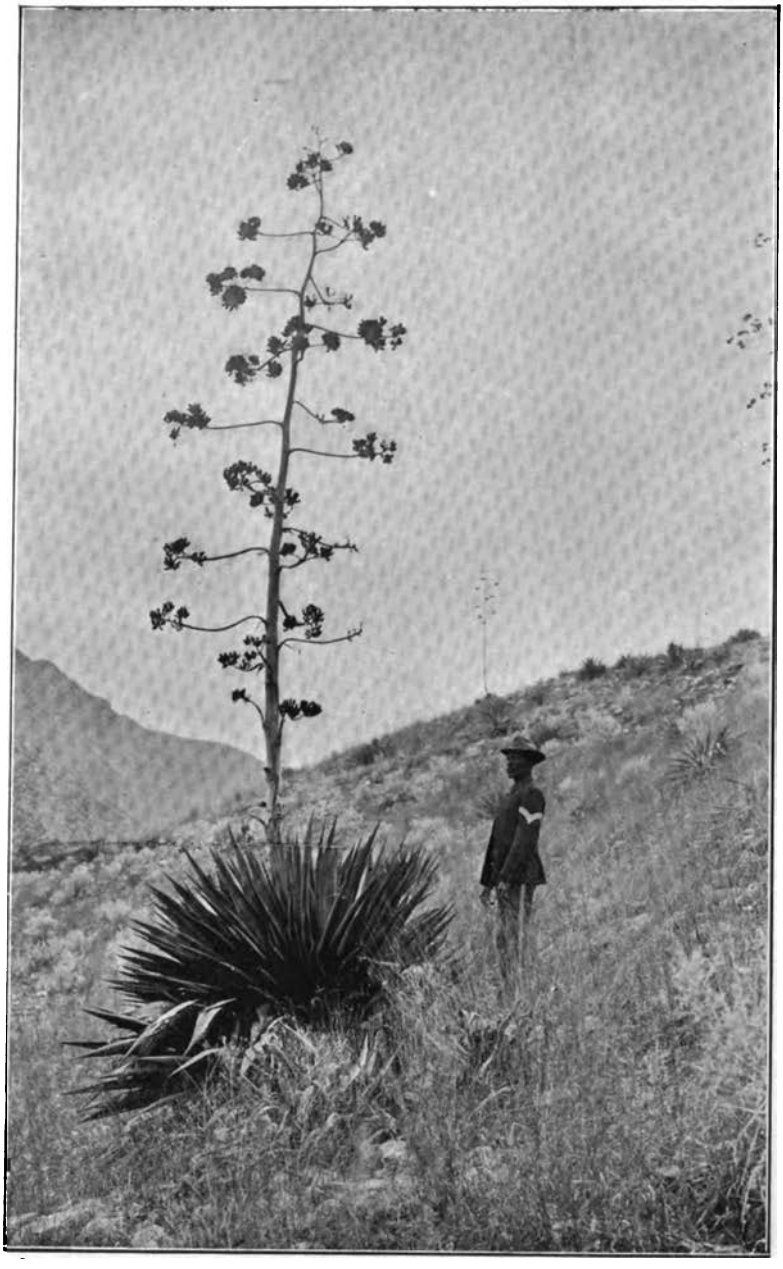

AGAVE PALMERI.

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AGAVE DECIPIENS.

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A CACTUS HUNT IN MOUNTAIN AND DESERT.

By Mr. F. A. Walton.

One of the peculiarities of the Cactus family, is, that very few species, or even varieties, are found in any one neighbourhood, therefore it is necessary to travel over great distances if you wish to see any considerable assortment. Knowing this, and wishing to see and study as many kinds of Californian Cacti as possible, I made arrangements with Dr. C. A. Purpus (who was staying at San Diego, California) to join me upon a botanical expedition across the mountains and down to the Colorado desert.

Starting from San Diego one foggy February morning at 8-30 a.m., in a miniature train consisting of engine, one truck, and one carriage, by the Cuymaca line, (pronounced Queermacker) passing through some fine fruit-growing country, the track winding about considerably so as to avoid heavy gradients, then passing over a ridge some 800 feet high, again going down into the El Cajon valley (pronounced Elkahoon), which is a practically frostless district, where oranges, lemons, and grapes grow to perfection; the sun breaking through the fog, and everything looking splendidly clear and bright, with a pleasant breeze that prevented the sun from being oppressively hot. The hills all round were some 3,000 feet high; and the valley, which is about 500 feet above sea-level, so splendidly sheltered from all rough winds. The train passed along very slowly, calling at a number of small stations for fruit, or returning empty packages from San Diego the market of this district.

The line terminates at "Fosters," about twenty miles from San Diego.

Foster is the one man there, he keeps the hotel, is station-master, runs the stage coach—or rather carriage, which was waiting for the arrival of the train, to take the passengers to their destination.

There were five passengers, packed away somehow into the queer looking carriage. These, with the mail, sundry luggage, and driver, quite filled all available space. The passengers had previously taken luncheon at "Fosters," were, after considerable difficulty, seated (one had to be perched upon the top of the mail bags, next the driver); the body of the carriage had a canvas covering erected upon a wooden frame.

Directly we left "Fosters," the road became very rugged and steep. We had for some time passed beside the San Diego river, which, by-the-bye, should have been called the sandy river, as there was no water visible, only sand and stones. The people about the neighbourhood said there had been no water seen there for two years, but that there was plenty of water under the sand and stones. In fact, the river was upside-down. Soon the sand gave place to immense rocks and boulders, as the grade became steeper. After crossing the river about a mile from "Fosters," we entered a magnificent cañon (all narrow valleys are called cañons in California). The road was sometimes cut into the rocky sides of the mountain, at others it was near the river bed, and sometimes hundreds of feet up the cliff, where a false step of one of the mules, or a bump over an extra large stone, looked as if it would precipitate us into the grand conglomeration of rocks below. The other side of the road the rocks being almost perpendicular, and hundreds of feet high, often with immense masses of rock hanging over the road, apparently waiting for an opportunity to fall and smash the roadway and whatever was upon it, in its descent into the gorge below. This kind of scenery continued for about seven miles, where we emerged upon a splendidly breezy plain or tableland, about 1,600 feet elevation. After passing across some five miles of this fertile "mesa," or tableland, we arrived at Ramona, the place I had agreed to meet Dr. Purpus. After passing a pleasant afternoon and evening at the very comfortable Ramona hotel, I had my last sleep, in a comfortable bed, for some time.

The only Cacti I had seen so far were *Opuntia tuna*, *O. Engelmanni* in several varieties, *O. prolifera*, and *O. serpentina*, none of which were at all remarkable.

Next morning, at eight o'clock, Dr. Purpus arrived, with a good, strong spring-waggon and team, of two strong mules between 15 and 16 hands high. The driver, Mr. Alfred Stockton, a fine young Californian, 6 ft. 3 in. high, had made

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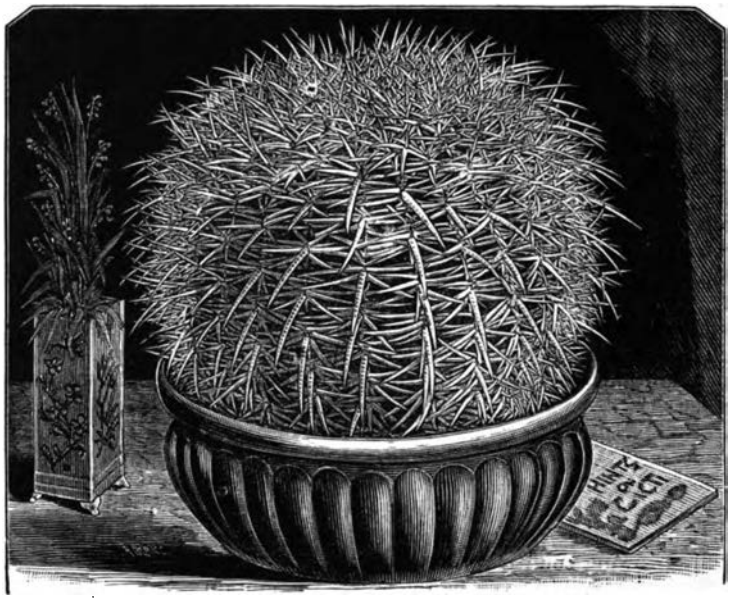

Echinocactus Grusoni.

several botanical excursions with Mr. T. S. Bandegee, of San Diego, and Professor Anthony, two of the most noted explorers and botanists in the State of California. We filled up the waggon with provisions for ourselves and the mules, enough to last a considerable time. The principal things taken for ourselves were bacon and beans; to which I added tea, coffee, tinned meats, etc. After crossing several fine valleys, each at a greater elevation than the last, we at length reached Julian, a thriving little town about twenty five miles from Ramona, and nearly 5,000 feet above sea-level. It is noted as being the finest apple-growing district in California. Even at this level we found several varieties of *Opuntias*, although they say that they have frost every month of the year, and the snow was quite thick upon the ground in places. After leaving Julian, which is the divide between the Pacific slope and the Colorado desert, we descended rapidly down, through a most picturesque cañon, to the small but thriving mining town of Banner. The road passes down the course of the stream, over boulders and through pools of water—down, down, always descending, nearly 2,000 feet in seven miles.

Soon after leaving Banner we saw the first of what we considered rare Cacti, viz., *Echinocereus Engelmanni* and *Opuntia basilaris*, but we decided not to get any specimens until our return journey.

At length, after another eight miles, we reached our camping ground for the night. The mules had gone altogether about forty five miles, having started some eight miles from Ramona, over a mountain pass 5,000 feet high, to our camp, which was about 4,000 feet elevation.

(*To be continued.*)

Botanical Curiosities.—Under this heading, *Pearson's Magazine* for March contains an interesting article on Cacti, with numerous illustrations. The regular readers of the Cactus Journal may not find therein many novel points in the matter of cultivation, or perhaps much that is really new to them, but they will find a well-written paper, calculated to amuse their friends and enlist their sympathy. The mere fact of a popular magazine devoting several of its pages to a subject of this kind, must be regarded as an indication of growing popularity, or at least of an increased interest being taken in this curious family of plants.

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INTERNATIONAL CACTUS JOURNAL.

It has been suggested to us, by several well-known collectors in America, Germany, and France, that the Cactus Journal should partake of a more international character, and be printed in three languages upon the same page, viz., English, French, and German. We should very much like to have the opinion of our readers upon this point.

On the continent of Europe there are a great number of fanciers of *Cacti* and other succulent plants, and in America many of the growers are Germans or French. Besides, every educated man or woman in either Europe or America understands one of the three languages mentioned.

Of course no alteration can be effected this year, as subscribers have sent their subscriptions, knowing the character and style of the Journal, and it would not be fair to them to make such a radical alteration without giving fair and ample notice.

One of the principal arguments advanced in favour of the alteration, is the increased number of Cactus growers who would be brought in touch with each other through our pages.

Another argument is, that the nomenclature may be more easily adjusted and amended. No doubt there are many more species of Cacti, etc., yet to be discovered, but at present if any one discovers, or has sent to them, what they *think* to be a new kind, they at once give it a name. An instance of this has lately come before our notice. A Mexican dealer, last year, sent samples of a new *Mammillaria* to five different dealers in Europe and America. This new plant was named differently by each of the dealers, and listed. We should suggest that all Cacti before receiving a name should be submitted to a competent authority, composed of, say, English, German, French, and American botanists, and that then the full description and name be published in the Cactus Journal; and that such name be considered the correct and authentic name. Then, again, all old names should be carefully considered and revised by the same authority, and the list with plates and descriptions published from time to time in the Journal. This could certainly be carried out more easily and effectually if the paper was printed in the three languages. We should be very glad if our readers will give this question their consideration and write us upon the matter.

A Group of beautiful Mammillaria.

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THE CACTUS HOUSE IN APRIL.

PAST the First of April now! and getting over the "sells" considered to be incidental to that date—the numbers of promising buds which turned out to be shoots after all; and how very similar the shoot is to the blossom bud! One wonders if blossom-buds sometimes think better of it and revert to shoots; at any rate, in many Cacti the blossom and the shoot originate from the same spots. But what a beauty and richness of colour there is in many of the shoots: those of the *Opuntia senilis* often of a yellow tinge; or *O. Leucotricha*, of pink and white; or the bright red or coral of *Epiphyllums;* and, loveliest of all, the shoots of *C. speciosissimus*—long columns of dark red, with the edges spotted with tufts of pure white thorn in perfect order.

In a cool greenhouse such as I am writing in, probably everything is late, but most of the Cacti are more or less on the move. The best of the *Epiphyllums* are now over, except one or two late varieties, such as *E. Gærtneri*, with vivid red blossom buds on every leaf, and even between the joints of the stems.

The *C. speciosissimi* look at their worst, and kind friends ask if they are dried up and dead, until closer inspection reveals to them many a blossom bud, even on one or two which are growing upside down for a variety. How the March number of the CACTUS JOURNAL made one's mouth water when reading of *Cereus* full of blossom, for, with the exception of the night-blooming *Cereus*, my rarer kinds persistently decline to flower. *C. Jamacaru, C. Peruvianus, C. Cærulescens* all refuse to oblige! though they have been in my greenhouse for many years. Our reliable friend, *C. speciocissimus*, is, I am told, really a *Phyllocactus*, but, at any rate, we may be sure this lovely variety will delight all comers every year with its red and purple sheen blossoms. The *C. flagelliformis* in all its varieties is equally reliable. One of my prettiest is an ordinary *flagelliformis* grafted upon a *C. speciocissimus* stem 2 ft. 9 ins. in length. The tails number three, 3 ft. 9 ins. in length, with fifteen short ones. There are upwards of one hundred and three blossom buds, though it is not to be expected that all these will come to perfection.

A very interesting variety of *C. flagelliformis* is the little-known Elkhorn variety, filling in the Cactus world the place of the Elkhorn fern in the fern world. If you could imagine the fern swollen out into a Cactus, you would have the Elkhorn *flagelliformis*. Mine is grafted on an *Akermanni* stem, and is still very much in its infancy, being less than 2 inches square in bulk, but covered with thirty-two growths of a lovely pink, shaded with purple tinge and white thorns.

Having noticed the propensity of a damaged Phyllocactus leaf to bear flowers, I have treated some of mine to a semi-pruning, and broken some of the leaves of those which showed no signs of blossom. It is early to speak of results, but certainly a *P. Vogeli*, thus treated, which did not blossom last year, and seemed disinclined to do so this spring, now shows some nine or dozen blossom buds. This was not my own idea, and was probably gathered from some suggestion in our most useful help, the CACTUS JOURNAL—though a gardener, when I asked last month how he treated his Cacti, told me he kept them short and gave them plenty of sunshine. Can any of our Cactus growers tell of any method of forcing all the flowers on a Cactus to open at once? We see azaleas and pelargoniums at flower-shows with every blossom open at the same time.

C. SPENCER BUBB.

SPECIAL NOTICE.—The first volume of the CACTUS JOURNAL, handsomely bound in cloth, with gilt letters at back, may be had from any bookseller, or direct from *The Editor, care of* Mr. E. W. ALLEN, 4, Ave Maria Lane, London, on and after January 25th This will be a splendid book of reference, having an index giving botanical names that have appeared during the year, in alphabetical order, &c, &c. Price 7s. 6d. As only a limited number will be issued, early application should be made.

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CORRESPONDENCE.

Low Temperature.

To the Editor of the Cactus Journal.

Sir,—My Cactus house, which contains a few plants of many sorts and kinds, was left in charge of a domestic servant for a few days. with the result of my afterwards finding that the temperature had fallen, in one night at least, to only 33 deg. F. I naturally expected great losses, but, so far, have not found any. Fortunately the plants had been kept rather dry at the roots. A few cuttings of *phyllocacti* had been left out in the open ground all the winter, either from being overlooked, or not deemed worth house-room. In January I was rather surprised to notice one of these little plants was alive. I placed a thermometer on the ground beside the plant and saw it registered as low as 26 deg. F., without the plant looking any the worse. However, on a further fall to 23 deg., with frost and snow, the little plant "gave in." There is still another cutting in the open ground which does not appear to be dead. I know appearances are deceptive in these cases, and I am anxiously waiting to see some sign of growth. If this takes place I shall be satisfied that some varieties of *phyllocacti* are not quite so tender as is usually understood to be the case. However, I do not advise anyone to leave *phyllocacti* out of doors in the winter, unless for an experiment.—Yours,

D.

Jadoo.

To the Editor of the Cactus Journal.

Sir,—If any of your readers have grown *Cacti* in "Jadoo" I shall be glad to know the result of their experience. It appears to me that this substance is very retentive of moisture, and that great care in watering would be necessary. In October last I potted some imported plants, which a friend had kindly given me, in a mixture of Jadoo and sand. After six months they showed no signs of rooting. The season of the year was certainly not in their favour, but I was afraid to continue the experiment any longer, and therefore returned to the use of sandy loam—whether wisely or not, I suppose time will show.

Nemo.

Growing Succulent Plants from Leaves.

To the Editor of the Cactus Journal.

Dear Sir,—Last Autumn I had a handful of leaves given me which had been knocked off a collection of valuable succulents then undergoing removal. I laid the leaves in rows on the surface of some fine, sandy soil in ordinary seed boxes, and the result has not only been of the greatest interest to me, but has exceeded my best hopes. I first of all noticed the tiny hair-like roots make their appearance from the leaves and then catch hold of the soil; then the base of each leaf seemed to plump up like a little ball, while the other part, beginning at the tip, began to wither away; and, finally, I was delighted to see the embryo plants commence to sprout out of the little plump piece which seemed to form the crown above the roots. At the present time the boxes are crowded with little plants, comprising many different varieties, some of which will turn out rare and valuable; none of which I had specimens of in my collection; and all of which are very beautiful and cost me nothing, save "thank you" and a little care. *Verbum sap.*

Yours faithfully,

Edgar Moss.

Leyton, Essex, April 6th, 1899.

To the Editor of the Cactus Journal.

Sir,—You will find many suggestions for "getting the best of Mealy bugs," as you call it, but eternal vigilance, hand picking, and an atomizer loaded with strong alcohol will usually be found effective. For scale, hand picking, scrubbing with an old nail or tooth brush and soapsuds will often be found effective—of course rinsing plant with water to get rid of the soap; but no amount of care or cleaning will help unless the old soil is also disposed of and the old pots thoroughly cleaned.

J. H.

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LIST OF AMATEURS WILLING TO SELL OR EXCHANGE THEIR DUPLICATES.

A charge is made of 1/- for Three Insertions in this List.

W. F. Gould, Rock Hall, Bath. Exchange only.
Mrs. Smith, Monmouth House, Topsham, near Exeter.
John Wilson, 24, Queen Street, Whitehaven.
C. A. Blogg, 65, Brighton Road, Croydon, Surrey.

WANTED.

* All the advertisers to whom this * is affixed are either members of the National Cactus Society, or are personally known by the Editor to be of good repute. Strangers wishing this * added to their advertisements must furnish two names of professional men (who will vouch for their respectability) accompanied by 1s., in P.O., or stamps, for trouble and expense of enquiry.

The proprietors of THE CACTUS JOURNAL are not responsible for any commercial transaction through the medium of their paper; but will use every precaution to prevent fraud. Should any dishonest or dishonourable transaction be brought before the notice of the Editor, the advertiser will not be allowed to again advertise in this paper.—THE EDITOR.

[A charge of 1d. for each three words or portion of three words is made in *Exchange*, *Wanted*, or *Sale* columns. A number or initial may be used at a cost of 2d. extra. All letters in answer in that case must contain a 1d. stamp, and addressed under cover to the Editor, who will forward them.]

WANTED, good plants of the following Pilocereus:—Celsianus (foveol tus), Columna Trajani, Fulviceps, Gounelil, Haagei, Niger, Curtisii, Polyptichus, Scoparius, Strictus, Subintortus. Williamsii. Address, with size and price, Charles Darrah, Heaton Mersey, near Manchester.

WANTED, Cactus seeds, in bulk, send list and price. F. A. Walton, Handsworth, Birmingham.*

WANTED, young plants of *Pilocereus Dautwitzii* also *Dautwitzii cristatus*. Send full particulars. W. 21.*

WANTED, to correspond with collectors or dealers in Central or South America who have some knowledge of Cacti. Shall be glad if any reader can give me the names and addresses of anyone who would be likely to correspond with a view to business. Walton, Handsworth Wood, Birmingham.*

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Phyllocactus.—Rooted cuttings of good sorts in exchange for other varieties of Cactus or Succulents. Stock limited. J. D., 133, Jamaica Road, London.*

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CEREUS *Carmen Murillo*, *Cereus General Enriquez*, *Mammillaria Rebeamiana*, *Melocactus Salvador Cereus Alamanga cristatus*, and other rare Mexican Cacti. Having recently purchased a number of the above from Professor Murillo at Jalapa, I am able to offer them at very reasonable prices. These are all rare plants, and some are grand specimens.—F. A. Walton, Friary Road, Handsworth, Birmingham.

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I have lately collected and purchased a great quantity of all the kinds of **MEXICAN AND NORTH AMERICAN CACTI** at present in cultivation in Europe. I have also a quantity of Novelties, of which I shall be pleased to furnish a List to bona fide Wholesale Dealers.

N.B.—It will be necessary to send enquiry upon business form, or else send business card, as this List is strictly for the Wholesale Trade, and not less than ten plants of any one variety will be sold.

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THE FRIARY, HANDSWORTH,

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The Cactus Journal.

Vol. II. No. 16. MAY, 1899. Price Sixpence.

EDITORIAL.

We received a communication from Mr. C. A. Blogg, hon. sec. to the National Cactus Society, saying that the Society will hold no competition this year at the Drill Hall, as he had received so few responses to his invitations for promise of exhibits.

***

The National Cactus Society, however, are offering prizes for collections of Cacti and Succulents at the Croydon Horticultural Society's exhibition, on June 28th, and the Croydon Horticultural Society are also offering a silver medal and other prizes for Cacti, etc. No doubt Mr. Blogg will give any further particulars required.

***

The Cactus Journal's offer of prizes for photographs has also met with such a very poor reception (only two entries having been sent in), that we have decided to postpone the competition until another time, when we hope a better response will be made to our renewed offer.

***

On the Continent we have better news to report. Our correspondent, Mr. Franz De Laet, of Contich, Belgium, has succeeded in gaining five first prizes for Cacti at the Antwerp Exhibition. We are pleased to hear of his success, and hope it may continue. We last year had the pleasure of seeing some of his collection at Ghent, where he came off a good second.

***

Our Editor gave a lecture upon "The Cactus and Cactus Collecting," before the Birmingham Gardeners' Mutual Improvement Society. A considerable amount of interest was evinced by the audience, and we trust some of the seed thus sown may fall upon good ground, so that the ranks of Cactus fanciers may be augmented.

We are pleased to say annual subscriptions are gradually but steadily increasing, and although we have disappointment with reference to Shows, Competitions, etc., yet the numbers of Cactus lovers and growers are certainly much greater than previous to the commencement of our publication. May they continue to increase, for we are sure no hobby will give more satisfaction and return for the time bestowed upon it than the collection and cultivation of Cacti and Succulent plants generally.

***

On another page is an article upon Cactus bedding. We should be glad to see more done in this way, and we are now planting out about eight good large beds entirely with Cacti. Many of the plants have just arrived from America, and we have found from our last year's experience, that plants become acclimatized quite as well, if not better, by being planted direct out of doors, that is, if they arrive in England at the right time, say May or early June. We shall at some future time, give our readers an account of the result of our Cactus bedding, illustrated.

***

In our June number, we propose to continue the article upon "Cacti we have Flowered," and as now is one of the best times in the year to flower our favourite plants, we hope our readers will send us a carefully written description of any Cacti they may have in flower. This will materially assist in the proper classification and correct naming of Cacti, besides being very interesting information, as the uninitiated think Cacti never, or hardly ever, flower, except *Epiphyllums* and *Phyllocacti*. We wish they could see our own collection, especially the *Echinocerei* and *Mammillaria*.

E

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CACTI OF BAJA, CALIFORNIA.

By Mr. F. A. Walton.

Baja, or Lower California, together with the adjacent islands in the Pacific Ocean and in the Gulf of California, possesses a very rich field for the lover of Cactaceous plants. Their forms are very distinct from those of the adjacent mainland of Mexico or California, and in some cases, no doubt, traces of connecting links may be found, yet many of the species are quite new. I am indebted to Mrs. K. Brandegee, Professor T. S. Brandegee, Dr. C. A. Purpus, Mr. Orcutt, Miss Cook, and other well-known Cactus specialists and botanists, for much of the following information, also my own personal observation upon the spot, and the opportunity of seeing many specimens of growing vigorous plants of kinds almost, if not quite, unknown anywhere out of San Diego, California, the nearest point from which most of the explorations have proceeded. Captain Porter and Professor Anthony have also assisted in enriching the list of living plants that have been placed at my disposal by the kindness of friends at San Diego. I shall in many cases adopt the nomenclature of Mrs. K. Brandegee, although I prefer to divide the genus *Cereus* into *Cereus* and *Echinocereus*.

The peninsula of Baja, California, although being under Mexican rule, is principally dominated by an English company, called Lower California Co., and Mr. Wm. M. Gabb, who was in the employ of the company, made, in 1867, the first collection of any note, and supplied Dr. Englemann with many dried specimens, but they were so unsatisfactory Dr. Englemann never published any of them, although he thought there were many quite new species. Mr. T. S. Brandegee, between the years 1889 and 1893, made extensive collections of the flora of Lower California, and published many able papers in the "Proceedings of the Californian Academy of Science." Dr. Weber, of Paris, also published some species in "Bulletin du Mus. Hist. Naturelle," 1895. Mr. C. R. Orcutt and Mr. Jones also published some, but Professor J. M Coulter's revision of the species was not quite satisfactory, as it was made from the very imperfect material of the Englemann collection, so that a pamphlet of Mrs. K. Brandegee appears to be the most reliable and complete list up to the present, though, no doubt, many other species and varieties will be added to the list, as the land becomes more thoroughly searched.

Travel in Lower California seems to be very difficult, and the only way of exploring it properly is by means of a vessel calling from port to port, and then making extensive land journeys. The roads (!) are bad, indeed are mere tracks to some mine or cattle ranch, and all plants collected must be taken many miles upon the backs of mules or burrows (donkeys) to some seaport. Then, again, the native Indians are not always reliable, in fact, some very queer stories are told of missing people, and hints at cannibalism are circulated.

Among the entirely new species found are a so-called *sub-genera* of *Mammillaria Cochemiea*. The plants so classed have flowers very elongated, tubular, with the sepals placed as a second ring, removed some distance below the petals; they are oblique, like *Epiphyllum Truncatum* or *Cereus Flagiliformis*, and, in fact, more resemble those flowers than they do any of the *Mammillarias*, so much so that I think it would be best to drop the generic name of *Mammillaria*, and simply adopt Mrs. Brandegee's name of *Cochemiea* as a generic name. A plant is not necessarily a *Mammillaria* because it bears tubercles or mammæ. If so, many of the so-called *Echinocacti* should be so classed. But as plants are usually distinguished by their flowers and seeds, which are less variable than the outward form or the spines, I think there is ample reason for giving these a distinct generic name. So far there are only four species found, but probably they will be added to as the peninsula and islands become more known. The names are *Hallei*, *rosiana*, *Pondii*, and *setispina*.

Cochemiea Hallei usually grows in clusters, 3 to 5 dm. high; spines are straight, closely set in clusters of about twenty, upon low, conical tubercles; the central spines are 7 or 8 cm., and the

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outer ones 3 or 4 cm. long, rather irregular in arrangement. Flowers, about 5 cm. long, rich scarlet, and formed as described above, arranged in a ring near the apex. The plants are from 6 in. to 12 in. high, and are found so far only upon Magdalena and Santa Margarita Islands. It is a very distinct plant, and, unlike the three following kinds, has quite straight spines instead of hooked ones, although the flowers are very similar.

Cochemiea Pondii, stems 3 in. to 9 in. high, sometimes branching upon old, reclining stems; spines, in clusters of about thirty, in three series, whitish to very dark brown, the central two or three being 1 in. to 1½ in. long, slender and hooked. The outer radial, whitish. Flowers, long, scarlet. Some of these plants are much lighter in colour than others. They have been collected only upon Cedros and Natividad Islands, and are consequently rare.

Cochemiea rosiana grows much taller, or rather longer, for it frequently grows upon rocky places, and hangs down; in fact, it is more luxuriant when so grown. The tubercles are wide and low, surmounted by few spines, the central one being strong, long, and hooked, varying from ¾ in. to 1½ in. long. The fruit is broad and flat, scarlet, lying between the tubercles, and looking like rows of flat scarlet buttons. Flowers, similar to the preceding ones. It is found upon the lower half of the peninsula, and Santa Margarita and Carmen Islands. Sometimes these plants grow to 2ft. or even 3 ft. long, and are very handsome if in good health.

Cochemiea setispina is the most beautiful of the group. The spines are white and hooked; the plant is similar to *Pondii*, but thicker and more beautiful, growing in quite large clumps upon the lower part of the peninsula, but in very inaccessible places. The flowers are similar to the previous ones, but I have not yet seen the fruit, as it is quite a new species, and the best in the group.

Mammillaria Goodrichii, named after Mr. J. Goodridge, surgeon of the ship "Harold," who found it on Cedros Island, and forwarded it to Prince Salm-Dyck, was named by him *Goodridgii*, in 1867. It was also brought by Captain Porter from Cedros Island, in 1894, and the next year from La Paz. Prof. A. W. Anthony, in 1896, found it in San Martin Island; and Mr. T. S. Brandegee, in 1893, from San Jose del Caby, and, in 1897, from Natividad Island.

Mammillaria dioica is somewhat similar to the foregoing, but grows from San Diego to Cape St. Lucas, and varies in its flowers. It has often been confounded with *Goodrichii*, but grows to a larger size, sometimes 10 in. high, and often branched, so that large clusters are formed. The tubercles are a glaucous green and cylindrical, rather woolly between; outer spines nearly white, central spine long and hooked, looking something like *Grayhami*. Flowers yellowish white, and are of two kinds. Some of the plants have *male* flowers, which are much handsomer and broader, but have rarely any fruit following; the other, or *female* plants, have long narrow petals, but the plants are covered by fruit afterwards. This seems to be a peculiarity of *dioica*, and this very interesting feature was pointed out by Mrs. Brandegee.

Mammillaria Palmeri is a very beautiful little plant, growing in clusters. It is similar to the above, but has its central spine straight, is more woolly; this also has two kinds of flowers: the male, having less divided style branches, rarely have fruit; others, female, with abortive anthers, and very small flowers, usually producing thick rows of berries.

Anyone wishing to fruit these plants should have both male and female plants to ensure success. This is found only upon San Benito Island.

Mammillaria Brandegei is a flattened or pincushion formed plant, somewhat after the more beautiful forms of *Mammillaria applanata*, and is very rare.

Mammillaria Gabbii seems closely allied to the above.

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INCIDENTS OF CACTUS COLLECTING IN CALIFORNIA.

EXPEDITIONS to the desert are not always bristling with hair-breadth escapes and blood-curdling adventures, as are sometimes told of hunting trips to the plains of Africa, or the jungles of India or Ceylon. Enough, however, occurs of impending danger and the overcoming of difficulties to give spice to the trip, which might at times become monotonous were it not for the constant vigilance which experience dictates.

As a rule there is little to be feared from the puma, or mountain lion, as it is locally named, or the terrible grizzly bear of other days, which has of late been so much hunted that it retires to the most rugged mountains, and will avoid man unless pursued and wounded; but horses are very much afraid if Bruin comes near, and there is danger of their breaking away, and leaving the expedition in a very unenviable plight, as can be imagined—perhaps many miles from water, in a trackless, desolate region, civilization only to be gained by leaving everything and walking back. The horses, one dark night, became very much frightened, and were only saved from breaking away by being tied with the stoutest of ropes to large trees or rocks, which is always our constant care to secure when selecting a camping place for the night. The next morning, on investigation, large bear tracks were found coming near camp, and then turning away. This at once explained the plunging fear of the horses the night before.

Perhaps there is more real danger from poisonous reptiles than any other animal—the more dangerous because at any moment one may be struck by the deadly fangs of the rattlesnake, which is quite common, and may be lying under any bush or stone. The writer was once searching for *E. polyancistrus* and *E. polycephalus* on a rocky hill, and only by the merest chance avoided stepping on a loathsome rattler nearly three feet long.

The realization of constant danger induces caution, so that in walking about there is not a moment that alertness is not exercised, and not a step is taken without looking for some possible danger—and it was this constant watchfulness that cheated the reptile of its victim. Several times have rattlers lain directly in the trail, and on nearly every trip they are seen and killed. At one time a locality on the side of a large mountain was being searched for *E. le Contii*. The plants were found among the large rocks that rose like steps on the steep side of the mountain, and the ascent was made by climbing from one rock to another, when upon drawing suddenly up to a shelving rock about two feet distant, a movement was seen as of a coiled rope in motion. A slight movement back avoided the stroke of the snake, but there was no time nor room for retreat, so it was a fight for life on that narrow rock; the only weapon available was the short-handled plant pick, which to be effective would also bring the hand within striking distance of the monster, but by bold and quick motions the snake was eventually killed.

Another source of danger to the desert traveller is the waterspouts, or so-called cloud-bursts. As a rule the rain rarely falls in some parts of the desert, but in others there are periodical rains, and an occasional downpour so abundant and violent as to give rise to the name "cloud-burst." The experienced pioneer, scout, or guide, as well as the prospector or gold-hunter, are always careful in the selection of a camping place, never stopping *in* a narrow cañon, however sheltered or inviting it may be, as it is well known that storm clouds suddenly arise back in the mountains, out of sight of unsuspecting campers, sheltered by high rocks on either hand, the first warning of danger being a dull roaring sound up the gulch, gradually growing louder, until with a crash, a solid wall of water twenty feet high comes suddenly in sight, sweeping all before it. Large trees, rocks, sand, and ground, are all carried along as so many feathers; a rush to higher ground is the only salvation of life. There is no time to save the animals or baggage of any kind. The writer has many times passed through or camped near a cañon in which a whole train of Government transports, mules, waggons, teamsters, and soldiers were wiped out of existence, and mostly buried out of sight by the rocks, sand, and *debris*, from just such a sudden flood or

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cloud-burst as above described. All is now quiet and peaceful, nothing of the kind has happened there since, but the place is terribly torn, showing plainly the effect of the gigantic forces of nature there applied. About one hundred miles from the above-mentioned place, we had frequently camped in a beautiful place beside a running stream, about half a mile from some innocent-looking mountains. When chancing that way once again, we were astonished to find that there had been a cloud-burst during our absence of a few days that had burst out of a seemingly small gulch, carrying a swath of destruction for a mile, sweeping across and changing the course of our little stream, strewing the country in places for half a mile in width with huge boulders, rocks, sand, gravel, and rubbish, and entirely destroying our beautiful camping place, in which we had so often peacefully slept. In the noted Death Valley region, about one hundred and fifty miles in another direction, our party narrowly escaped destruction by deciding not to stop for the midday lunch, and to rest the horses as usual, but to push on and make an early camp at a spring of water—the only one for many a weary mile. It had been raining for several days almost continuously, and our journey was anything but a pleasure trip—as can be imagined—with everything soaked and dripping, and the horses splashing through the muddy soil of the locality. On these deserts there is no turf or sods of grass, roots, &c., to hold the soil in place, so with every rainy season the fine sand and sedimentary soil work away like so much snow, and even the few scattering plants that try to exist are undermined or torn up and washed away. I have seen *E. le Conti* and *cylindricans* with *O. Ehinocarpa* as well as other plants, with several long roots, turned up in the air to be burned in the sun and torn by the wind, which at times sweeps over these wastes with great violence.

But to return to our story. We reached our camping place at about three o'clock p.m., with the blackness of night behind us, and had hardly gotten into shelter when the rain began to fall in torrents, yet we could see that the great storm centre was passing over where we had just passed through. In attempting to pass this way a week later we found the country for miles all torn into deep chasms and piled with rubbish and utterly unpassable, so that we had to make an extended detour to again reach the trail and resume our journey. We then saw how we had escaped, by only a few minutes, one of those terrific cloud bursts which are the dread of all desert travellers. A trip to the region adjoining the great Colorado river and the discovery of *M. Alversonii* and *O. Parryi*—that remarkable Cereus-like Opuntia—and also the hunting out of *O. Ursina* ("Grizzly Bear"), *O. Chloritaca*, and the pretty *O. Tessellata cristata*, and many others, may form the text of another paper at some future time, detailing more of the pleasant features of Incidents of Cactus Collecting in California.

A. H. Alverson.

NATIONAL CACTUS SOCIETY.

Tuesday, April 25th, being the day fixed for inspecting the collection of Cacti at the residence of Mr. W. N. G. Lance, at Islington, several members of the N.C.S. availed themselves of the invitation to join in what proved to be a pleasant afternoon's chat upon the way to grow and the way not to cultivate Cacti.

Mr. Lance has a smart collection of Cacti, but a bad house to keep them in. The plants, many of them, are good specimens, but look drawn for want of air and light, and the effect of London smoke was plainly seen on the *Mammillarias* and the *Pilocereus*. Several plants of *Phyllocactus* give promise of some good bloom. Having partaken of tea with Mrs. and Miss Lance, and thanking our host, we left for our own quarters, each one, no doubt, thinking what he and she would do if they had the difficulty to contend with as our friend Lance in growing Cacti.

Croydon. C. A. B

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A SUCCULENT TOUR TO LOWER CALIFORNIA.

By Dr. C. A. Purpus.

(*Continued from page* 39.)

Almost all the bushes and many of the Cacti were clothed with masses of *Tillandsia recurvata, Linn*, an epiphytical succulent, which almost bore them to the ground.

The nearer we approached Calmalli the more interesting became the landscape, the more gigantic became *Cereus Pringlei, Wats.*, and which gave a phantom-like appearance to the surrounding country.

By degrees appeared also the beautiful *Cereus Thurberi Engelm.* with its yellowish-green body and black-brown spines. It ramifies mostly near the ground. I found this beautiful Cereus afterwards on gneiss and granite ground.

In a cañon I suddenly saw a remarkable succulent growth, a yellowish-green column from 20 to 30 feet, running to a point, and covered with short thorny branches and small grayish-green leaves. This wonderful growth filled me with astonishment, for I had never seen anything like it before. When I had the opportunity to inspect it closer, I found it to be *Fouquieria columnaris, A. Gray*, one of the most wonderful forms of plant life ever seen. The Mexicans call it "Cirio," on account of its resemblance to altar-candles. Towards evening we reached Calmalli, where I hoped to stay some time, since my intended journey to Magdalena Bay was frustrated.

Calmalli is on a high plain, which is intersected by several Arroyas, and is surrounded by the huts of the Mexicans, which are mostly built of Yucca Valida. Towards the west rise several trachytic basaltic mountain groups, while those to the south are slate, with numberless summits. My first trip was to a gravelly plain south of Calmalli, where I saw a continuance of several miles of *Fouquieria columnaris*. I found here columns from 40 to 50 feet high, and 2 feet in diameter, many branching out at the top in the form of whips, and among these there were trees whose tops bent nearly to the ground, and fresh tops growing above gave them the appearance of elephants' trunks. The ground was covered with numerous Agaves, especially *A. deserti Engelm.*, and among them grew *Ects. Emoryi var. rectispina, Cereus Pringlei, Cer. gummosus* and *Cer. Thurberi, Opuntia Calmalliana Brandegei*, etc. On the slopes of the hills and mountains I found the very interesting and beautiful *Cereus Brandegei Coulter*, one of the most beautiful of the species, the colour of the spines varying marvellously in the sunlight. Further on I perceived here and there a specimen of the milky *Mammillaria Brandegei Engelm.*, with its thin mostly brown spines, also various Opuntias, amongst which was *Opuntia alcahes Web.*, armed with its horrible spines. You can always find *Cereus Brandegei* and *Mammillaria Brandegei* together upon trachytic, basaltic, slatey and gravelly ground. Good clay soil mixed with gravel is the best for the culture of these succulents. Among them you find the very common and aromatic *Bursera microphylla A. Gray*, which on account of its low and deformed stature is often taken for a succulent. Upon its branches a succulent parasitical plant, *Loranthus Sonorae*, with beautiful red fuchsia-like blooms, often grows.

My next trip was to a chain of granite mountains about twenty miles from Calmalli. The way led through splendid groups of *Cereus Pringlei*, mixed with *Cer. Thurberi, Cer. gummosus, Ects. Emoryi var. rectispina, Opuntias, Fouquiera columnaris*, and masses of *Agave deserti Engelm.* On the granite rocks I saw the interesting *Ficus Palmeri Wats.*

I was very much surprised to find on the slope of the mountains *Mammillaria setispina Engelm.*, and which until now I had not been able to collect as a living specimen. I came upon it afterwards also in gneiss, trachyt, porphur, and in a sandstone conglomerate. Ground composed of granite gravel appears to suit it the best. From one of the hills I look down into a veritable wood of *Cereus Pringlei* and *Fouquiera columnaris*, mixed with thickets of *Cereus gum., Cer. Sargentianus, Opuntia*, and *Cer. Thurberi*, some of the latter being from 20 to 30 feet high, and nearly 2 feet in diameter. Along the Arroyas I found a thin-limbed Opuntia, similar to *Opuntia frutescens Engelm.*, and which, on account

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of its piercing, horrible barbed spines, is the most troublesome of its species, and often causing very painful wounds.

After searching for several weeks the surrounding places of Calmalli, I resolved on a trip to San Pablo, from forty to fifty miles away. So one fine February morning I set out in company with a Mexican and several mules. The way led through slate mountains, and from there into a sandy plain covered with the already mentioned Cacti and shrubs. At night we camped under a group of *Cereus Pringlei*, and about the middle of the next day arrived

Echinocactus Poselgerianus.

at the entrance of the cañon, in the middle of which is a farm belonging to a Mexican. Here, for the first time, I saw the remarkable *Veatchia cedrosensis A. Gray*, which on account of its grotesque form, is called the "Elephant tree." This is indisputably one of the most interesting of all forms of tree life on this richly-endowed peninsula. I found here also the quaint chandelier-form of *Cereus Cochal Orcutti*, called by the Mexicans "Cochal." From here we went slowly upwards along one of the Arroyas. To the right arose perpendicular rock, and from them hung *Echinocereus Engelmanii Lem.*, and which I also found later in crowds upon the tableland near to San Pablo. The farther we rode up the valley the more lovely it became. There soon arose on both sides gigantic rocks covered with Cacti and shrubs. Near to the settlement, which lay on the banks of a small stream, grew the magnificent *Erythea armata Wats*, the most beautiful to me of all the fan palms, with its immense greyish-blue fans. We halted in the shade of a palm, and I resolved to stay here for several days. On making a trip the next morning up the cañon, I met with a continuance of the lovely palms, in the shade of which grew a very beautiful *Nolina*. Everywhere appeared masses of *Cereus Cochal*, covered with fruit and small yellowish-green flowers. After staying here a fortnight, I returned to Calmalli to prepare for a journey to Santa Gertrudis, an old mission upon the way to Santa Rosalia, in the gulf of California. I found it a very interesting district, with its same kind of Cacti as San Pablo. In the garden of the mission grew splendid date-palms, olives, and pomegranates, also gigantic *Opuntia-tuna*, which had been planted by the mission people. From one of the eastern mountains I had a beautiful view of the surrounding country. In the background appeared the ill-famed island "Tiburon," inhabited by a race of wicked Indians. Upon the beautiful plateau grew masses of *Cereus Cochal*, various *Opuntias*, *Echinocereus Engelmannii*, and *Yucca Brand.*

After staying a few days at Santa Gertrudis I returned to Calmalli, from where I soon began my homeward journey to San Diego.

PROF. PURPUS.

WE should be glad to publish any notices of coming exhibitions where Cacti may be shown for competition. We are informed there will probably be some good *Phylocacti* and other kinds on exhibition at the coming Temple Show, where the best of everything usually finds a place.

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SOME AGAVES OF THE UNITED STATES.

(*Continued from page* 40.)

MANY species, while quite young, also produce an abundance of suckers or offsets, which frequently form a circle of progeny around the parent plant. One instance is recorded of a plant with forty-two well-developed heads, besides many smaller ones, growing from a single root. A number of species belonging to the Euagave section are viviparous. Young plants or bulbilli are produced on the branches of the scape, in place of, or in connection with, the capsules. These give a queer appearance to the plant while they remain attached. They eventually fall to the ground, take root, and grow into good plants. The Agaves are well fitted to sustain life in the desolate, barren mountains and superheated valleys to which they have been assigned. Their vitality is most wonderful. Plants are frequently taken up by the roots, and kept for months, with no water or care of any kind, and afterwards on being planted show good growth. Unfortunately little is known in regard to the pollenization of these plants. Bees and flies are seen upon them, and although some flowers of some of the species have been pollenized artificially, most of the others mature their fruit, thus showing that the pollen from the upper flowers must have done their work upon the stigmas of the lower ones. Why the flowering stems of some Agaves should attain so great a height is not easily explained. If birds or high-flying insects assist in pollenization, the task of finding the flowers would evidently be much facilitated by their commanding position. The height doubtless assists in disseminating the seeds to a greater distance than would otherwise be possible. As the capsules open from above, the swaying of the poles must cause the seeds to be caught by the air currents as they are dislodged. Being thin and flat, they may be carried to a considerable distance beyond the circle of progeny formed by suckers before reaching the ground.

The Agaves are injured by an insect, scarabæus (called maax by the natives). This insect bores through the centre of the plant, and destroys the softer parts. When in cultivation the natives hunt this insect with pointed sticks, and fill up the holes with pebbles and soil. Domestic animals, especially cattle, hogs, and goats, are very fond of these plants when young, and will even chew the mature leaves for their juice, and it is no uncommon thing to find their tongues pierced through and through with a network of the terrible spines.

From the time of the Aztecs these plants have been utilized in various ways. The inhabitants of the country make saleable cloth, sacks, ropes, and other articles from the fibres. The softer parts afford them important articles of food and drink, also a soapy liquid for washing. The flowering stalks make handles for their lances, poles for fishing, and walls for their houses. The end spine with attached filament serves as needle and thread. Humboldt tells of a bridge at Quito having a span of one hundred and thirty feet, made of ropes of Agave fibre four inches in diameter. It is said that Agave juice is mixed with wall plaster and used as an insecticide to keep out the white ants which are so destructive in tropical countries. The spiny leaves of the Agave have caused it to be used very effectively as a hedge plant in the Mediterranean region. The *Agave Americanus* (commonly known as "the Century Plant") blossoms at about the age of ten years. At the time it is ready to send up its flowering stalk, a most remarkable upward flow of sap takes place to meet the new demands. This liquor or sap, called "agua de miel," or honey water, is very sweet, and is much used both by the Mexicans and Indians. They cut out the central bud and leaves from the plant, and insert a long cylindrical gourd to receive the liquor. Some plants produce an average of two gallons per day, and keep up the supply for months. Pulque, a universal drink in Mexico, is made by collecting quantities of the "miel" in vats of corohiele and causing it to ferment. Though it is said to acquire a strong taste from the vats, it is much liked both by foreigners and Mexicans, and has become an article of commerce. From the "pulque" is manufactured a fiery and intoxicating liquor called "mescal." Both

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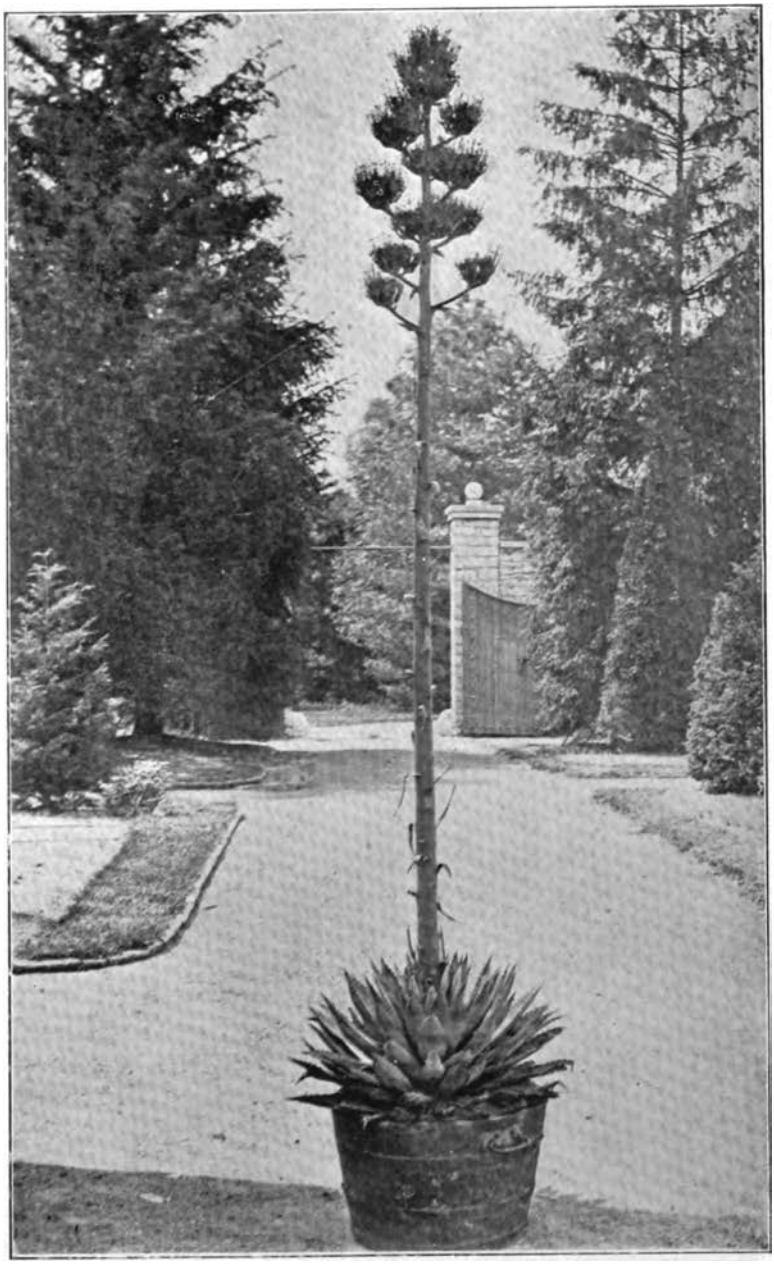

AGAVE APPLANATA.

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AGAVE ENGELMANNI.

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pulque and mescal are regularly peddled in the streets in receptacles made of pig-skins, which will hold from twenty to thirty gallons.

Considered from the standpoint of food, certain species of agaves growing in the South-western States are esteemed great delicacies by the Indians. The species most eagerly sought after are *Agave Palmeri* and *Agave applanata Parryi*. Other species are also used, but they are quite indiscriminately called "mescal," as is also the jelly-like mass prepared from them, as well as the intoxicating liquor distilled from the juice. The process of cooking these plants by the Indians is as follows:—A large pit is prepared and lined carefully with small smooth stones. A fire is kept up within the pit until the stones are thoroughly heated, and then raked out, leaving the pit ready for use. The plants are trimmed until nothing is left except the hearts, which consist of the sweet, juicy stalks and young leaves. These are heaped on the hot stones in the pit, covered over with grass and earth, and left to steam for two or three days. By this time all except the fibrous tissue is reduced to a jelly-like mass, very palatable and nutritious. The fibres and epidermis, which are separated from the edible portion of the plants, are not thrown away, but are thoroughly washed and made into ropes.

Agave Engelmanni (our illustration) was named after Dr. George Engelmann, a noted writer on Agaves. This plant was bloomed and fruited in the St. Louis Botanical Garden in 1891. The plate represents the plant about one-twentieth its natural size. The leaves, about three in number, in a rosette 3 ft. broad, and 18 inches high, of a deep green, the flower stem about 7 ft. high, closely covered with flowers.

Agave applanata (our illustration also, photographed from a plant flowered in the St. Louis Botanical Gardens) is usually described as a Mexican species, but Dr. Trelease alludes to it as occurring within the United States boundary. A species in the mountains of Western Texas is apparently the same as the form common in European and American greenhouses under this name. The Texas plant is variable, but many specimens show a resemblance to Engelmann's *Parryi*. There also seems to be many grades intermediate between this and Prengli's *Agave Huachucensis*, upon which Dr. Engelmann founded the description of *Agave Parryi*.

A CACTUS HUNT IN MOUNTAIN AND DESERT.

By F. A. Walton.

(*Continued from page* 42.)

In choosing our camp several things had to be considered; but most important of all were water and wood.

Our first camp was at the foot of a solitary old dead cotton-wood tree. This wood burnt up quickly, and was very welcome, for it had suddenly grown cold as the sun went down. Water was also found near, and, as it turned out, there was no more to be found for about twenty-five miles.

The place chosen had evidently been used for a similar purpose by others, for there were the remains of several old fires. Mr. Stockton took the mules to the water, also taking with him a bucket for water for ourselves, while Dr. Purpus and I prepared supper. The everlasting frying-pan came into use again, and we had bacon and beans, also some tinned Strasburg sausage warmed up in the frying pan for a change.

It soon became intensely cold, and we were glad to sit round the fire, and put plenty of wood upon it to make a good blaze. As we felt very tired we soon prepared our bed, which consisted of finding a fairly smooth place, spreading the cart sheet upon it as near to the lea of the old tree as possible to keep off the wind, then putting on our overcoats, wrapping our blankets and rugs round us, and lying down in a row to keep warm, first pulling the loose end of the cart sheet over us as a kind of bed quilt; this reached high enough to cover our heads if we liked. Dr. Purpus said he never took a tent when camping in the dry deserts,

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as there was seldom any rain, and practically no dew.

Here I had my first experience of musical notes of the coyotes (prairie wolves), for directly we lay down one gave a clear, bell-like note, rather high pitched; then another answered it in another long drawn-out note, but somewhat lower pitch; then a third one joined with still a different note; then the first two sang a duet, then another joined, making a trio, quartette, and chorus, which ended up with a grand finale of what appeared to sound like a free fight between a hundred or two. The Doctor said all this noise had probably been made by two or three animals only, for he had heard *one* only make almost as much noise.

This was continued at intervals until daylight next morning, so I did not get much sleep the first night through the coyotes and the intense cold.

There was a new moon, and in the extremely clear atmosphere we could see the narrow crescent, continuing right round the opaque body (which was also distinctly visible), until the horns seemed to meet. This peculiar phenomenon is seldom seen in any other part of the world. The stars were also splendidly brilliant, and I could understand why California had been chosen for the Lick Observatory.

At 6 a.m. next morning we were all astir. First we lighted a fire to warm ourselves; then coffee was in request, but we found the water left in the bucket over night almost a solid lump, and we had to thaw it by putting the bucket over the fire. We were about 2,000 feet elevation—(there was an error in last month's issue; it stated 4,000 instead of 2,000)—and directly the sun got above the horizon we felt its benefit, for we started about 7 a.m. with our overcoats on, but by 8 a.m. we were glad to take them off, and at 9 a.m. we took off our coats, and by ten o'clock we were so hot we could have dispensed with some of our other clothing, but were afraid of being blistered, the sun was so hot, and we had neither sunshades or umbrellas.

We were by this time upon the desert proper, the home of the Cactus, Yucca, and Agave. There was also a large number of other plants and shrubs, such as *Moskete*—a kind of *Acacia*—*Junipers*, *Fourquierias*, and other spiny plants.

Everything that grows upon the desert or hill sides in the neighbourhood bears thorns or spines—a very wise provision of nature, for the herbiverous animals would very soon utterly exterminate any plant not so protected; indeed, many of the Yuccas were so eaten by the few cattle that manage to find a living even in this dry desert, that they were hardly recognisable, until they grew tall enough to be out of reach.

We passed several dried-up alkaline lakes, some quite crusted over with white crystals and no plant life whatever upon them; but the sage bush grew in some places that were distinctly alkaline, though not much else would grow there.

At mid-day we came to an old deserted post, with springs of water and quantities of *Moskete* trees. These were a sure sign of water being near; in fact, old desert travellers keep a sharp look out for these trees when crossing a desert, as they make splendid firewood, as well as being a sign of water. We camped here for an hour, but the water was so alkaline we could not drink it, and the mules would only have just a little; luckily we had a supply from the last camp, enough for ourselves, but the poor mules had to go thirsty. We saw one of the desert sign-posts here, pointing east, and saying, "Next water 17 miles." These sign-posts are useful to travellers, as they can tell whether to stop and camp or go on to the next water. Near the spring we found several dead cattle, dried up and not decayed; the heat and the alkaline nature of the soil, with the extreme dryness of the atmosphere, had arrested decomposition, though evidently the coyotes had been feasting upon parts most to their taste. The travelling so far had been very hard for the mules, as the wheels sank deep into the sand with a crunching sound that soon became very monotonous. We travelled along the sandy beds of "wash-outs," as they are called caused by floods or "cloud bursts." When it does rain in these localities it literally tumbles down, and the depressions are quickly formed into temporary lakes, and leaving more or less river beds washed clear of all vegetation, and often fairly straight.

Soon after starting again we came to some hilly country, and had to descend a very steep cañon to the mesa land, about 1,000 feet lower elevation.

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Upon the hills each side of the cañon were the first *Echinocactus Cylindraceus*—and what grand plants they were! Up to this time I had only seen garden specimens of these beautiful plants, and all of them more or less globular in form; but here they were true to name, being parallel cylinders from eighteen inches high to three or four feet, and about ten to eighteen inches thick. Then the splendid variety of colour and form of spines! Some were pink, some red, some yellow, and some *pure white*, with an ivory-like texture.

Then, again, some of the spines were short—say three inches—and regular in position; others were long and twisted about in a most fantastic way, and others with one extra long spine on each group, standing out three or four inches from all the others, giving a quaint pattern or design, as it were, to the plant, quite distinct from any other Cactus.

It was as much as I could do to refrain from jumping out of the waggon and collecting these beauties, but we had decided to go to the end of our journey before commencing to collect

Echinocereus Engelmanni, that most beautiful of all the *Echinocereus*, was also plentiful about this neighbourhood. It grew in small and large clusters some three or four feet across, some with, say, fifty heads. These were very varied, but more of the yellow and white spined variety than the darker versicoloured variety. The spines in most cases were so dense that the stems could not be seen; they were from one to two, or even three inches long, and shone again in the bright sunlight.

(*To be continued.*)

CORRESPONDENCE.

To the Editor of the Cactus Journal.

Dear Sir,—Enclosed find order for 3s.—half-year subscription—to make mine a full year, having sent for first six months last December. If you had called for one year's subs. it would have been sent, but you only called for six months, and I want to be a yearly subscriber, so that I can compete for the list of prizes you offer in the February number of your worthy little Journal. I consider it, so far, the greatest achievement in Cactus literature, and the illustrations are simply superb. I would not be without it for all the monthlies on the list, and wish you the biggest success.

The prizes I intend to compete for are the following numbers: 3, 5, 6, 7, 8, 13, 15.

Yours most truly,
A. Barmeyer.

Bayside, Long Island,
April 12th, 1899.

To the Editor of the Cactus Journal.

Dear Sir,—A contributor to the March number, mentioning the sterile properties of some cultivated fruits, speaks of the banana as rarely bearing seed; but if our friend from Somerville could have accompanied me into the jungles of Borneo, he might have found the sterility should have been limited to the severely cultivated varieties. I have had bananas in Borneo which were such a mass of seed as to be absolutely uneatable. The Dyaks only eat this fruit when unripe as a cooked vegetable.

I remain, dear sir,
Yours truly,
C. Spencer Bubb.

To the Editor of the Cactus Journal.

Dear Sir,—I beg to refer C. Spencer Bubb, Esq., to my article on "Pruning Phyllocacti," which appeared in the July No., 98. I think my experience as set forth therein will answer this query.

If it be any satisfaction to him, I may add that my plants (*Phyllocacti*) were specially noted for their profusion of bloom, in variety, at the Grand Summer Flower Show held at the Alexandra Palace, May, 1898, when I was awarded the Gold Medal.

Yours faithfully,
H. Geo. Bourne.

New Southgate, April 24th, 1899.

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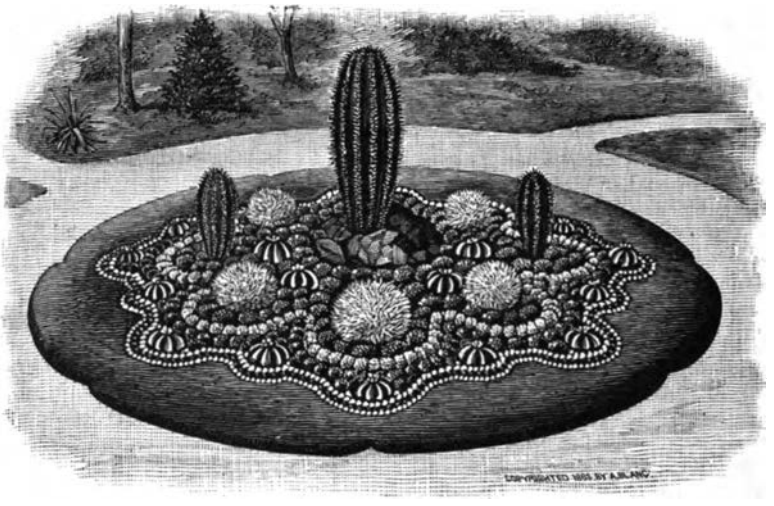

CACTUS BEDDING.

THE illustration is from a Cactus bed grown in Philadelphia, and we think it is certainly very attractive in its neatness and regularity.

At the Chicago Exhibition there was a very long bed, filled with some very rare Cacti, and planted by Mr. A. Blanc, of Philadelphia, who used to go very largely into Cacti, but now has practically discarded them in favour of Cannas.

We cannot congratulate him upon the change, for, although Cannas are very beautiful and gorgeous in a hot climate, yet they are not nearly so interesting as Cacti. However, everyone to their taste; but it is seldom that any lover of Cacti ever forsakes his love.

We grew two beds of Cacti last year, containing about 1,500 in all. They were round beds, about twelve feet across, and were very striking in their appearance. One of them had a large seven-pointed star, formed with *Echinocereus rigidissimus* (the rainbow), graduating from plants one foot high down to three inches. The centre was a grand clump of *Mammillaria Nogalensis*, with over fifty heads. Between the points were seven *Echinocactus Wislizeni*, about sixteen inches across, and the intervening spaces were each filled with *Mammillaria*, a different kind and colour to each space. The "rainbows" flowered beautifully; and what gorgeous flowers they are!

The other bed was composed of some tall *Cereus gemmatus* and smaller clumps of *Mammillarias*, with a number of *Echinopsis* of various kinds, which flowered very well indeed.

Most of the plants we used were newly imported plants, which arrived the first week in June, and were put out of doors at once. They became well-rooted during the summer, and were potted up in the autumn. They are now well established in pots, and many are well set with bloom. They had one good soaking with water after potting, and then were kept quite dry until April. This is evidently one of the best and simplest ways to establish newly-imported Cacti.

Some really beautiful designs may be formed with Cacti in beds, they are so symmetrical in shape, and are no trouble after once planting. Of course, if the weather is very dry they should be watered, but even this is optional.

We do not recommend plunging the plants in pots, but this may be done if a good hole is made for each plant, and a few cinders or old broken pots put in before the pot is inserted. This will ensure good drainage. If this precaution is omitted you may lose many valuable plants, as the soil would become sodden during wet weather.

Be very careful that the soil of the Cactus bed is very light and porous. It is also wise to have the bed well arched, and above the surrounding level of the

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garden or lawn. Very pretty effects can be gained by carefully arranging the plants with reference to the colour of their spines, and some comparatively cheap kinds may be had with very brilliant spines—such as *Echinocereus candicans* (red) or *rigidissimus; Engelmanii* (mixed), *pectinatus* (white), *caespitosus* (white), *chloranthus* (red); *Echinocactus Wislizeni* (green, with red-brown spines), *Emoryi* (similar), *Grusoni* (brilliant yellow); *Mammillaria elegans* (white), *Pfeifferi* (yellow), *Nogalensis* (yellowish brown), *Arizonica* (grey), *Grahammi* (grey); *Echinopsis*, various kinds, mostly bright green stems; *Cereus*, columnal kinds, such as *gemmatus* (green), *colubrinus* (green), *Emoryi* (yellow), *Sargentianus* (green), and *Pilocereus senilis* (white).

If the proposed bed be against a wall, be careful there is no drip from spouts, etc., or you may lose some valuable plants.

One of the advantages of Cactus bedding is, that the bed is always tidy and interesting. The plants being practically full grown when planted, we do not have to wait a long time before the bed is in perfection. Then, again, the bed is perfect until the time comes to house the plants, and is never overgrown and untidy like many beds of other flowers.

Most of the kinds mentioned simply require protection from wet in the winter, as they will stand a considerable amount of frost even, if the damp is kept away.

Again, the same plants may be used year after year, so that in the end they are cheaper than many other bedding plants that have to be replaced each year. Try a bed this year, and you will be pleased with the results, and all friends and visitors will be much interested.

CACTUS SOIL

THERE is one golden rule with reference to the soil most suitable for growing any wild plants, viz., imitate nature as nearly as possible.

This we find rather difficult to do in the case of the Cactus family, as they are found wild, growing in so many different kinds of material (soil is hardly the correct word to use).

Probably the greatest quantity are found in broken-up and disintegrated granite. In some places it takes the form of a coarse sand, in others broken rubble, all sizes, from that of a pea to a cocoanut.

Some kinds are found in similarly broken-up limestone, others at the edge of brooks (usually quite dry), in a quite clay-like soil; but in every case the drainage is perfect, especially when the plant grows upon the slope of hills or mountains. This is generally the case; there are always ten times as many found upon the south side as upon the north side, showing their preference for sun, even in a land where sunshine is the rule and not the exception, as is often the case here.

Granite is composed of many kinds of mineral substances, and when it becomes weathered and broken up it becomes mixed with a quantity of decayed vegetable matter. The roots of the plants cling to the large pieces of stone, and search about in the finer material for nourishing material to build up their succulent stem.

Granite is an igneous rock, and the intense *baking* sunshine in the native habitat of most Cacti, seems to almost burn the earth up into powder—at least, it dries all the moisture out of the surface—therefore we recommend the following mixture, which may be made up in large or small quantities:—One part red sand; one part silver sand; one part pulverized bricks, or dust from brick-yard; one part old mortar; one part granite, or marble chippings from the stone-yard; one part very old rotten leaf mould; half part finely broken charcoal; one part of burnt earth; three parts loam. Well mix but do not sieve out the small pieces of rock, or lumps—in fact, don't use a riddle at all. It will be seen that a good proportion of the above has been through the fire, and the whole will make a very porous mixture, yet the larger pieces will absorb and hold some moisture for a considerable time.

For *Phyllocacti* and *Epiphyllums* we recommend the above, with one extra part of leaf soil, and one part of very old well-rotted manure.

Many people cover the surface of the

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soil, between the plant and the edge of the pot, with small pieces of white marble chippings. This certainly looks neat and clean; it also prevents surface evaporation, and also saves the plants from being splashed with the soil when watered with a rose or syringe.

Be careful and don't use gypsum, or what is often called "white spar," in rockeries, which is a sulphate of lime, not a carbonate as marble.

We recommend Cactus growers to mix up a good quantity of soil at one time. It will keep indefinitely and save a lot of trouble. The above mixture will do for all kinds of Cactus, and many other kinds of succulent plants, especially those found in arid desert and mountain lands.

WANTED.

* All the advertisers to whom this * is affixed are either members of the National Cactus Society, or are personally known by the Editor to be of good repute. Strangers wishing this * added to their advertisements must furnish two names of professional men (who will vouch for their respectability) accompanied by 1s., in P.O., or stamps, for trouble and expense of enquiry.

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[A charge of 1d. for each three words or portion of three words is made in *Exchange*, *Wanted*, or *Sale* columns. A number or initial may be used at a cost of 2d. extra. All letters in answer in that case must contain a 1d. stamp, and addressed under cover to the Editor, who will forward them.]

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CEREUS *Carmen Murillo*, *Cereus General Enriquez*, *Mammillaria Rebsamiana*, *Melocactus Salvador Cereus Alamanga cristatus* and other rare Mexican Cacti. Having recently purchased a number of the above from Professor Murillo at Jalapa, I am able to offer them at very reasonable prices. These are all rare plants, and some are grand specimens.—F. A. Walton, Friary Road, Handsworth, Birmingham.

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The Cactus Journal.

VOL. II. No. 17. JUNE, 1899. PRICE SIXPENCE.

EDITORIAL.

THE weather is just suitable for Cacti and succulent plant generally. Care should, however, be taken that they have plenty of water, and most kinds will do with a good syringing two or three times a week, in addition to the usual watering of the soil.

***

IT is a good plan, where practicable, during really hot weather, to put your plants out of doors, letting them have the full benefit of the grand sunshine we are now getting. If they are well supplied with water, say three times a week, they will as a rule flower well, and grow well afterwards, besides the growth will be firm and mature, and produce good flowers next season.

***

WE planted out a large number of newly-imported plants last year, directly they arrived, first week in June, in the open ground, first cutting off all the roots; we potted them up in October, and have left them upon a shelf all the winter in full sunlight.

***

THESE plants are now covered with buds or flowers; in fact, they have many more buds than others we potted up and kept under glass all the time, besides being much cleaner, and quite free from thrip, mealy bug, scale, etc.

***

THEY were principally *Mammillarias*, *Echinocereus*, and *Echinocactus*. We should not recommend some of the more tropical kind of *Cereus*, *Phyllocactus*, or *Epiphyllums*, but we are trying *Anhalmiums* and *Opuntias* this year in addition. *Echinopsis*, we know will do as well so treated.

WE have inserted an article upon Captain Porter, who was a Cactus collector, and who introduced several new kinds from Lower California, one of which, an *Opuntia*, that bears little round flat leaves, is named *Porteri*, after its discoverer. It was one of the last plants sent home to San Diego before his death.

***

WE hope shortly to be able to produce in the CACTUS JOURNAL an illustration of some Cactus beds, that we believe are quite unique, either in England or elsewhere. We shall be glad of photographs of Cacti from our readers, also descriptions of the Cacti they have flowered this year, and as it is now the height of the season for such flowers, we hope to receive many descriptions during the month.

***

REPORTS of flower shows where Cacti are exhibited will be welcome.

***

AT the late Temple Show was a grand exhibit of *Phylocacti*, including some of the most beautiful of the genera, ranging from pure white to intense purple, and some of the most delicate shades imaginable.

***

SPECIAL NOTICE.—The first volume of the CACTUS JOURNAL, handsomely bound in cloth, with gilt letters at back, may be had from any bookseller, or direct from *The Editor, care of* Mr. E. W. ALLEN, 4, Ave Maria Lane, London, on and after January 25th. This will be a splendid book of reference, having an index giving botanical names that have appeared during the year, in alphabetical order, &c., &c. Price 7s. 6d. As only a limited number will be issued. early application should be made.

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A SUCCULENT TOUR TO THE DESERT DISTRICT OF SOUTHERN NEVADA, NORTH-WESTERN ARIZONA, AND SOUTH-WESTERN UTAH.

By Dr. C. A. Purpus.

Last year, about the middle of April, I set out with a waggon from Springville, Tulare Co. (California), for a tour in the above-named districts. I went from here to the Greenhorn Pass, that leads into the valley of the Kern River, rather a dry piece of land, where I met the first Cacti. The eastern slopes of the mountains are covered with quantities of *Yucca Whipplei Torr.*, which in May the year before I found in full bloom, and which presented an incomparably beautiful aspect. At the foot of the mountain range grew *Opuntia basilaris* plentifully, quite covering the slopes in some places. From here I went towards Walker Pass, leading into the Mojave desert. At the upper end appeared for the first time *Opuntia echinocarpa Engelm.*, the only tree like *Cylindropuntia* of this desert. It varies considerably. Stem and branches are sometimes so thickly covered with cruel straw-yellow spines, that they disappear altogether. At the same time I found the *Yucca arborescens Torr.* (*Yucca brevifolia Engelm.*), which, in smaller or larger patches, spread to the height of the Pass, over 5,000 feet. We continued our tour towards the Pass after a two days' stay, and reached in a day's journey. All along the road I noticed the *Opuntia basilaris Engelm.* in considerable quantities. On the eastern slopes appeared bigger patches of *Yucca arborescens*, among which grew *Opuntia basilaris* and *Opuntia echinocarpa*, the only Cacti in this part of the Mojave desert. In a very romantic spot we halted, near a spring. On the left rose rugged mountain tops, the northern part of the desert spreading in front of us, and beyond that, in the east, towered the black El Paso range, mostly of a volcanic nature. From here we continued the journey to Indian Wells, at the foot of Sierra Nevada, the bare and rocky tops of which rose into the cloudless sky on the left. From Indian Wells we went across the desert to the Argus mountains. The sandy plain was to a large extent covered with *Larrea Mexicana Mor.*, in between which grew, as single Cacti, the *Opuntia echinocarpa*, and here and there *Opuntia basilaris*. The following morning we reached the Argus mountains, a bare, rocky mountain range. Here we met for the first time the *Echinocactus polycephalus Engelm.*, in a very stony and rocky soil (granite and basalt), first in single specimens about 30-60 cm., later on growing together in clumps from about 1.20-2 m. in diameter. Like the *Larrea Mexicana*, it is rarely found higher than 4,300 ft. During one of the following days we arrived at the camp of a German, Georg Varnberg, a friend of mine, His camp was at the foot of Argus Peak. The highest point of this mountain range is 6,555 ft. above the sea-level.

Herr Varnberg is a native of Baden, and possesses here several good gold mines. I stayed several days, and visited one day the eastern part of the mountains where the magnificent *Echinocactus polyancistrus* appears I found it in single specimens in gravelly soil, rich in quartz, mostly in parphyry, slate, and granite, together with the *Echinocereus Engelmanii Lem.*, which, however, grew more on rocks. While the *Echinocactus polycephalus* scarcely grows in places higher than 4,000 ft.; the *Ec's. polyancistrus* only starts at this height. In other places, which we shall get to know later on, it even appears at a height of 6,000 ft., and is found as high as 8,000 ft., like the *Echinocereus Mojavensis Rumpl.*

In sandy soil grew masses of *Op. echinocarpa* and *Op. basilaris*; further I noticed the *Opuntia ursina Web.*, and *Opuntia rutila Nutt.*, discovered by F. Coville (Death Valley Exped). Besides these succulents, the *Yucca arborescens* covered, in great quantities, the slopes and plateau of the whole mountain range. It is found here at a height of over 6,000 ft., and often forms beautiful trees about 20 ft. high.

After a stay of several days we continued our journey. The road went along the grand Madurango Range, across a plateau, covered with *Yucca arborescens*, intermingled with shrubs and the above-named *Opuntia*.

After having crossed a very dry, desert-

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like district, we reached during one of the next days the small mining town of Darwin, where a white-blooming kind of the *Opuntia basilaris* occurs, which was also gathered here by Caville. From here we went on along Owen's Lake to Keeler, and higher up the valley. Towards the west rose the rugged points of the mighty, snow-covered chains of Sierra Nevada, almost straight from the valley, and presented a grand appearance. On the right extended the chain of the Inyo mountains, a very dry, partly volcanic mountain range, covered in the highest parts very thinly with *Tinus monophylla Torr. et Frem.* and *Juniperus Californea Carr.*, and *Utahensis Engelm.* We reached Big Pine after a several days journey, through an interesting, well-watered district, and then turned eastward across the Pass, that leads through between the Inyo and the White Mountains.

I made up my mind to stay here several days, and the next morning I explored the mountains on the left of the pass. On the lower slopes grew *Opuntia rutila* and *Op. basilaris*, also *Echinocereus Engelmannii*, and as high up as 6,000 ft. I found *Echinocereus Mojavensis* growing in big clumps on a chalk rock. It was literally covered with flowers of blood-red colour, red inside, and reminded me very much of *Echinocereus phoeniceus Lem.*, to which it comes very close, and of which it might perhaps be a variety. In higher regions I found an *Opuntia* similar to *Op. rutila*, differing, however, in its spines, but in spite of that perhaps it may be a variety of it.

On one of the following days we went on over a plateau, grown over with *Tinus monophylla, Juniperus Californica var. Utahensis* and *artemisia tridentata*, down to Deep Spring Valley, a desert-like vale at the lower end of which is a small lake with strong springs on its southern bank. We reached the only Ranch in this valley towards evening, and I decided to stay a day. On my way there I found the charming *Opuntia pulchella Engelm.* which, covered with its big deep-red blossoms, affords a lovely aspect. I gathered these *Opuntia* later on, even between 7,000-8,000 ft. above the sea-level, and for that reason I think they can stand the winter. It grew here in purely sandy soil; its cultivation should not offer any difficulties.

In the granite mountains to the south of the Ranch, which I visited the next day, I found splendid specimens of the *Echinocactus polyancistrus* growing in gravelly clay soil. The next day we went across volcanic mountains to Fish Spring Valley. On the slopes of the Trachyte mountains I saw several specimens of *Ects. polyancistrus* covered with their lovely magenta-red blooms, a beautiful sight. Fish Spring Valley is situated rather high, between 4,500 to over 5,000 feet. In the west rise the White Mountains, about 11,000 feet high, and towards the east the Palmetto Range, which nearly reach the same height. The highest mountain of this range is Mount Maginder (about 10,000 feet). In the evening a high wind got up, black clouds came from the west across the White Mountains and it began to rain.

When we woke up the next morning even the lower mountains of both ranges were white with snow. We started rather early, and reached the border of Nevada after a short journey. By-and-by we met with the *Yucca arborescens*, which formed no patches, but were scattered over the slopes of the mountains. We stopped at the so-called Palmetto Mine, and I decided to stay a week. Next morning I mounted Mount Maginder, which was still partly covered with newly-fallen snow. On the way I found *Ects. polyancistrus* in magnificent specimens on chalk and slate soil, and in greater quantities than I had ever seen it. It is first met with in these mountains at a height of 6,000 feet, and will be found as high as 8,500 feet. Now and again I noticed also the *Ehinocerus Engelmannii*, which was not to be found above a height of 7,000 feet; also the *Opuntia pulchella*, which commences at 6,600 feet, only grows on level ground, and which extends up to 8,450 feet. Here it was at this time covered with buds. Partly wading in snow, I reached the top of the mountain shortly after noon, and was surprised to find at a height of 10,000 feet, an *Opuntia* with yellow blooms. It is a hybrid of *O. rutila* and *O. Missuoriensis* P.D.C., and must be able to stand the winter perfectly well. The view extended over a large part of the desert district of Nevada, with its interrupted mountain ranges, the highest tops of which were still covered with snow. Perfectly

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wonderful are the contrasts of the black or dark brown volcanic mountains and the white alkali deserts, the so-called dry lakes that extend along the foot of the same. In the west you see in a long line the rugged tops of the Sierra Nevada covered with snow, affording a grander aspect than you could imagine. Here at your feet the bare desert full of the glowing hot sun, over there the icy snow-covered mountain tops, a contrast the like of which does not exist.

(To be continued.)

HOW TO FLOWER THE CACTUS NOW CALLED PHYLLOCACTUS.

THE remarks are by a very successful exhibitor, cultivator, and hybridizer of the late Cactus, and from whom I have had, many years ago, many of his beautiful varieties, raised by crossing into *Cereus speciosissimus*, but now I have only two kinds left, viz., *C. speciosa grandiflora.* and *C. T. elegans*, and these are some raised by him perhaps fifty years ago,—a Mr. J. Green, forty to fifty years past; he was a prize-taker for such things. These are his remarks:—

"The compost that I use is an equal quantity of light turfy loam and pigeons' dung, and one third sheep's dung, exposing the mixture one year to the influence of the summer's sun and winter's frost to mellow. When wanted for use I add one third of sandy peat, in both cases mixing them well together. I grow the young plants from February to July in the forcing flower-house, kept from 35 deg. to 60 deg. Fahr. I afterwards remove them to a shelf in an airy situation in the greenhouse, exposed to the mid-day sun, giving them plenty of air and little water. The plants that I want to flower the following September are placed in the forcing house the first week in December, giving them very little water for the first ten days, and gradually increasing the water as the plants advance in growth. About the first of February I *stop* all the young shoots, which soon become well ripened; from this time I decrease the quantity of water until they become quite dry, in order to throw the plants in a state of rest. In the beginning of March I replace them in a cold, shady situation in the greenhouse, treating them as before. For plants to flower in August, I place a quantity more in the forcing house the first week in January, treating them the same as those for September; only they are put to rest in the greenhouse a fortnight later, and replaced in the forcing house one week sooner. The first flowering plants are put in the forcing house the end of January, and will come in flower about the middle of March When these plants have done flowering, and are removed from the drawing-room, or greenhouse, I prune out most of the old shoots that have flowered so that the plants are furnished regularly with young shoots for flowering the ensuing year. These plants are also placed in the forcing house for ten days to ripen the young wood and dry up the moisture, and are then put to rest in the greenhouse as usual; such plants will flower a second time in October. Others put in the forcing house the middle of February will flower about the end of April; if then pruned and dried, and put to rest as before, they will flower a second time in November, and so on in proportion. I re-pot them at all seasons whenever the plants may require it, always observing to keep the pots well drained with potsherds that the moisture may pass off readily. This process may be considered troublesome, but superior growth and abundance of flowers amply show the care bestowed. By the above treatment *C. speciosus* and *Jenkinsoni* have generally produced from ninety to a hundred fine expanded flowers at one year old. The plants that I sent to the Society (May 21st, 1833) were about two years old; the *C. speciosus* bore 200 flowers, *Cereus speciosissimus* 72, and *C. Jenkinsoni* 194. I prefer growing them in wooden tubs, with nice stakes fixed to the tub, to the usual mode of supporting them with sticks driven into the ball of the plant which I consider injuries the fibre and makes the plant appear unsightly."

J. C.

P.S.—The above remarks are copied from Mr. Green, 1856, then Gardener to Sir Edward Antrobus, Bart., Cheam, Surrey.

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CACTI WE HAVE FLOWERED.

Echinocactus cylindraceus longispinus.—These flowers are about three inches across, of a rich satiny-yellow colour, formed in a double ring near the centre of the plant, but so completely covered with the immense spines that they are hardly noticeable. The petals are in several rows of about ten each, rather narrow, one and a-half inches long, much twisted and fimbriated near their points. The anthers are very small and numerous, embedded low down in the centre of the cup of the flower; the stigma has many rays, fifteen or sixteen, raised much above the level of the stamens upon a thick columnar yellow pistil. The fruit is large and yellow. The plant from which the above flower was taken is nearly three feet high and twenty inches across, and is covered with immensely long twisted spines of a pinkish colour. June 1st.

Rebutia minuscula.—This miniature plant, only one and a-half inches high, has a ring of eighteen beautiful carmine flowers, all springing up from the base and open at one time. The flowers are trumpet shaped, about one and a-half inches long, and three-quarters of an inch across. The anthers are few and bright yellow, the petals are in two rows of about six, the sepals are not very distinct, and are a little lighter in colour. I consider this plant one of my gems. June 1st.

Mammillaria applanata Heyderi.—Plant is about nine inches across, and has two rows of large straw-coloured flowers, each about one and a-quarter inches across, petals in two rows of about twelve. Anthers very numerous, light straw-yellow, many rayed, stigma of greenish-yellow. The flowers are very starry in appearance, and last several days. Large club-shaped pink fruit are formed, and are ripe the following year about flowering time. June 1st.

Epiphyllum Russellianum Gaertneri.—Flowers two and a-half inches long, formed in ones, twos, and threes at the end of branches. In form it is star-shaped, petals in two rows of about six; they are taper in form, and very pointed. Cepals also in two rows, anthers bright yellow and almost globular, stigma five-rayed, nearly white, and standing well out in front of the anthers. The colour is usually bright scarlet, but I have several varieties from a light rose-pink to a beautiful coral-pink. The plant is very floriferous, every branch bearing at least one flower at its termination, which lasts for several days. The long, brilliant scarlet buds are also very attractive for some time before the flowers expand. The plants do better when grafted, but will flower if on its own roots, though not quite so freely; besides, it is longer forming a good-sized plant. June 1st.—F. A. Walton, *The Priory, Handsworth.*

I have succeeded in flowering a seedling variety of *Cereus flagelliformis* which possesses a most distinct flower. It is very large and handsome. The stem of the plant is almost identical with *C. flagelliformis*, but is of slightly stronger growth. The flower has long lanceolate petals which are salmon-pink, deepening to a rosy salmon at the edge of the petals, the centre assuming a lovely glowing warm tint, the throat being white, with a charmingly tinted green base. The pistil is white and surrounded by numerous mauve-pink stamens which give the plant a peculiar and interesting appearance. The petals were 3 in. in length by about 1½ in., the flower stem 2½ in. long. The bloom when fully expanded measured about 2¼ in. and assumed much the appearance of *C. speciosissimus.* It bloomed on May 26th and lasted two days.—H. Geo. Bourne.

Euphorbia polygona.—The flowers produced by this odd variety springs from the spine bases, and are produced either singly or in bunches of two or three. The flower stem is short and red with from seven to eight acaule leaves (red) terminating in a most peculiar button-like flower, which is very small, but most quaint and interesting. The blooms carry five black close petals, which are covered with a black watery deposit. These are joined around the body of the flower, just allowing top of same to show through. The anthers of this curious bloom are red tipped with crimson and gold. My plant, one foot in height, showed at one time 45 buds. The first flowers opened on May 2nd, and the plant still carries many which have yet to expand. June 3rd.—H. Geo. Bourne.

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A CACTUS HUNT IN MOUNTAIN AND DESERT.

By F. A. Walton.

(*Continued from page* 59.)

Towards evening we branched away to the right in search of a warm spring that Dr. Purpus had heard of. After going about two miles out of the proper direction indicated by the signboard as the next watering place, we came to the foot of a large mountain that appeared to have a great white scar at its foot. This proved to be caused by the hot spring. It was not good water, in fact, very alkaline, and so unpleasantly warm that we searched about for other springs, and eventually found one of fairly drinkable water.

The hot spring seemed to have dissolved the granite of the mountain and deposited it again all over the surface for many acres in the form of whitish tufa.

The ground in some places was quite boggy, and a quantity of small shrubs and trees were growing about. These were the first we had seen for many miles. We also noticed many traces of animals using the spring. There were the bones of some, and the horns of the wild bighorn sheep, besides traces of wild cats, pumas, bear, cyotes, etc., evidently a regular haunt for the animal as well as the grandest habitat of Cacti we had yet seen. We were sorely tempted to pitch our camp and commence collecting, but eventually decided to go on to the water mentioned upon the signpost; so we had to hurry away, for the night falls very suddenly in these latitudes, and the mountain would be between us and the sun, considerably shortening the daylight. We found the water at last, but it had grown quite dark when we pitched our camp, but the water proved more alkaline than the last, and we had brought very little with us. Well, this camp was similar to the last; we were serenaded again by the cyotes, and it was intensely cold throughout the night, although we were on the very edge of the desert, which gradually sloped away from us until it reached 200 feet *below* the sea level. Next day we searched for Cacti, but found nothing fresh, so we went on to the desert for some distance, but the Cacti became fewer and of commoner kinds. After a time we decided to make a forced march back to the hot spring, where we arrived in time to camp.

All went well until after supper, then we noticed the mules were very restless, straining at their tethering ropes, snorting, and appearing very uneasy over something. Dr. Purpus said he thought there must be a bear or a mountain lion about (a puma is called a mountain lion). He had hardly finished speaking before we heard an awfully thrilling sort of a cry, between a yell, a howl, and a mew. "That's a mountain lion," said the Doctor, "We had better go at once and look after the mules, or they will break away, and then there will be a pretty mess." We brought the mules near our camp, double roped them, and piled plenty of wood on the fire. Of course I was rather nervous, as it was the first really dangerous wild animal we had come across. We had a chat round the camp fire about the dangers of camping out. It appeared that one of the greatest dangers was that the mules or horses might break loose and make for home; and as we were about sixty miles from anywhere, it might have been unpleasant, for we should have had to walk, and take all we required with us.

Horses and mules are quite as much afraid of bears as of the puma. We heard the cry of the mountain lion several times during the night, and we judged it could not have been more than a hundred yards away. This proved to be the case, as we proved next morning by its fresh foot-marks in the swampy ground, even within fifty yards of the camp it had been going round. There were also other fresh footprints of wild cats; these are even more feared by the Californians than the puma, for they will more often attack people, and as they are about four times the size of a tame cat they are rather awkward customers to deal with.

The night did not pass without an alarm that might have been rather serious for some of us. For precaution's sake I slept with my revolver under my air pillow, so as to be handy if required. About midnight I awoke with a start, and felt

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the sleeping bag in which Dr. Purpus slept being pulled out from between Mr. Stockton and myself. Of course I at once thought the mountain lion had the poor doctor by the neck, and was dragging him out, for I could distinctly see a form bending over the end of the sleeping bag. I at once cocked the revolver, and called out to the doctor to know what was the matter. He very coolly replied, "It's all right, Mr. Walton, I was so hot between you two that I could not sleep." Well, that was a near squeak for the doctor!

There being no other alarms we all slept until daybreak, and were glad to see the mules safe and sound, although still very restless and uneasy, evidently having had no rest all night, but as we had decided to stay, and commence collecting where we were, this did not matter.

At sun-rise, as usual, there was a beautiful clear sky; and although it had been decidedly chilly during the night, it was not long before it began to be very warm indeed, as our camp was pitched in a semi-circular hollow on the eastern side of the mountain, and there was nothing to shelter us from its full force. The white rocks and lime deposits seemed to reflect and concentrate the heat, so that we were glad to commence scouring the side of the mountain for specimens directly after breakfast.

At last we were at work in earnest, but we found carrying the splendid specimens we did find down to the camp very hard work. It is rather an awkward thing to climb down a steep mountain side with a load of spikey cactus plants, and I had several fairly good scratches before reaching the foot of the mountain.

After luncheon we decided to try the mesa land to the east, and we were soon amply rewarded by finding even better specimens than on the mountain, and all the kinds were represented.

They were principally *Echinocactus cylendraceus*, in great variety; some with immense long spines, some with very short ones, others with very twisted spines, again others quite straight and regular. The colours varied from pure white, yellow, pink, and dark red, with all the intermediary shades.

Then there was a grand lot of very varied *Echinocereus Engelmanii*, the finest we had yet seen.

Mammillaria dioeca and *phelosperma* were also found, but they only occurred at considerable intervals and never two plants of a kind together.

Opuntia tesselata was also found here, but only the kind with the long yellow spines, not the *denudata* or *cristata* forms, which only occur on the Mojavi desert. Many kind of *Opuntias* were also found during the day, but we could get those nearer home, so did not collect them.

The sun was so hot, that the sand almost scorched you if you touched it with your hand, and at one particular white rocky place, the glare was so great that I felt quite faint as I was returning to our camp with a load of spoil.

We were by this time getting very particular what we did take; only the very best and most curious would satisfy us.

Towards evening I discovered a really magnificent white spined *Echinocactus cylindraceus*, 5 feet 6 ins. high, and about 18 ins. thick.

When I told the doctor about it, he said it would be impossible to move it, still I determined to try next morning first thing, even if I had to leave many of the other plants I had collected, for I imagined how it would look in the centre of my conservatory at home.

We were very tired by night after such an exciting day; a real red-letter day to me, so we soon went to bed, and to sleep, fortunately not being disturbed until next morning. I had dreamt of my giant *cylindraceus*, and had planned how to get it into the waggon.

After breakfast next morning I proposed that Mr. Stockton should put the mules in, and the doctor and I should try what could be done with the *giant*. The doctor did all he could to dissuade me, but I was obdurate, so we set out in the direction of my plant, collecting many rare and curious Cacti, and some plants of *Fourquiera spinosior*, by the way.

The giant was soon laid low, but not before I had taken a photograph of it with the doctor standing beside it, in case I should not succeed in getting it to England, so that I could convince unbelievers as to the size these grand plants grow to in their native home.

The waggon soon came up, and I began to see the difficulty of raising such an enormous bulk over the side without

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damaging the spines. Eventually we put the cart ropes round the centre with my coat between them and the plant. I then got into the waggon, and the others, having first placed their coats at either end, commenced to lift it up, while I pulled from above. When we eventually got it to the edge of the waggon we nearly had an accident, through my saying to Mr. Stockton, "If I were to let go, you would say I had dropped it on purpose." This so tickled them on account of the doctor's name that they began to laugh, and I, catching the contagion, almost did let the plant fall on the doctor. It would have been rather serious if the plant had slipped, for it was not only spikey, but very heavy, weighing in its box over 5 cwt.

I was very pleased when eventually we had this plant comfortably in the waggon, with a few others to keep it company from two to three feet long. These filled up all the bottom of the waggon, and we kept the lighter ones for a top layer.

We started back with light hearts, and a much heavier waggon; for we had also a truss of hay and a sack of barley for the mules, besides our own provisions and equipment.

By-the-bye, the barley was not quite so palatable as the mules could have wished, for during the jolting of coming down one of the river beds the oil lamp had been smashed, and all the petroleum had soaked into the barley. At first the mules would not eat the barley, but eventually hunger forced them to do so.

Had we had horses instead of mules, they would never have eaten any of the grain, and there being nothing else but a little hay, they would have run very short, and we should probably have found a difficulty in getting them up the steep grade back home again.

Mules are much better than horses for roughing it; and in California, they would bring a much higher price, on account of the feed being very indifferent and scarce, owing to the previous two seasons being so excessively dry.

In some places I could have bought downright good-looking horses for ten dollars each; in fact many thousands were slaughtered for their hides as there were no buyers, and the cost of transit was too great to pay for their being sold in the eastern States.

(To be continued.)

SOME NOTES ON YUCCAS.

The stately Yuccas of liliaceous alliance and of American origin had attracted the attention of European horticulturists long before Linnæus classed the well-known species, four in number; and, indeed, three of these were based on specimens cultivated in European gardens, two of them—*Yucca aloifolia* and *Yucca Draconis*—on the elegant and very accurate figures of cultivated plants by Dillescius, published some one hundred and forty years ago. Ever since, Yuccas have remained favourite plants in gardens on account of their palm-like—either frigid and pungent, or gracefully curved—foliage, shooting up from the ground in pleasing, regular masses, or raised into the air on simple or branching trunks, all overtopped by immense white panicles of hundreds of glorious flower bells. It thus happened that these plants fell into the hands of professed horticulturists; and perhaps because the herbaria could afford only few and very incomplete specimens, scientific botanists rather shunned them, as they did many other such plants, and notably among them the Cacti. With these they share the precious property of being easily propagated from some, perhaps a single imported specimen; hence the individual peculiarities of such specimens, propagated a thousand and a thousandfold in the course of a century (for most of our cultivated Yuccas have been thus long in the hands of nurserymen), at last impress the observer with the dignity of specific characters. But the botanist finds it necessary to fall back on the organs of inflorescence and fructification as the only safeguard in such difficulties; but here, however, the cultivated Yuccas leave us in the dark. They yield us flowers, to be sure, but we find the flowers so very similar in many species, and again so dissimilar in different forms of the same species, that evidently but little light can be obtained from their study. And the fruits? Unfortunately, the Yuccas scarcely

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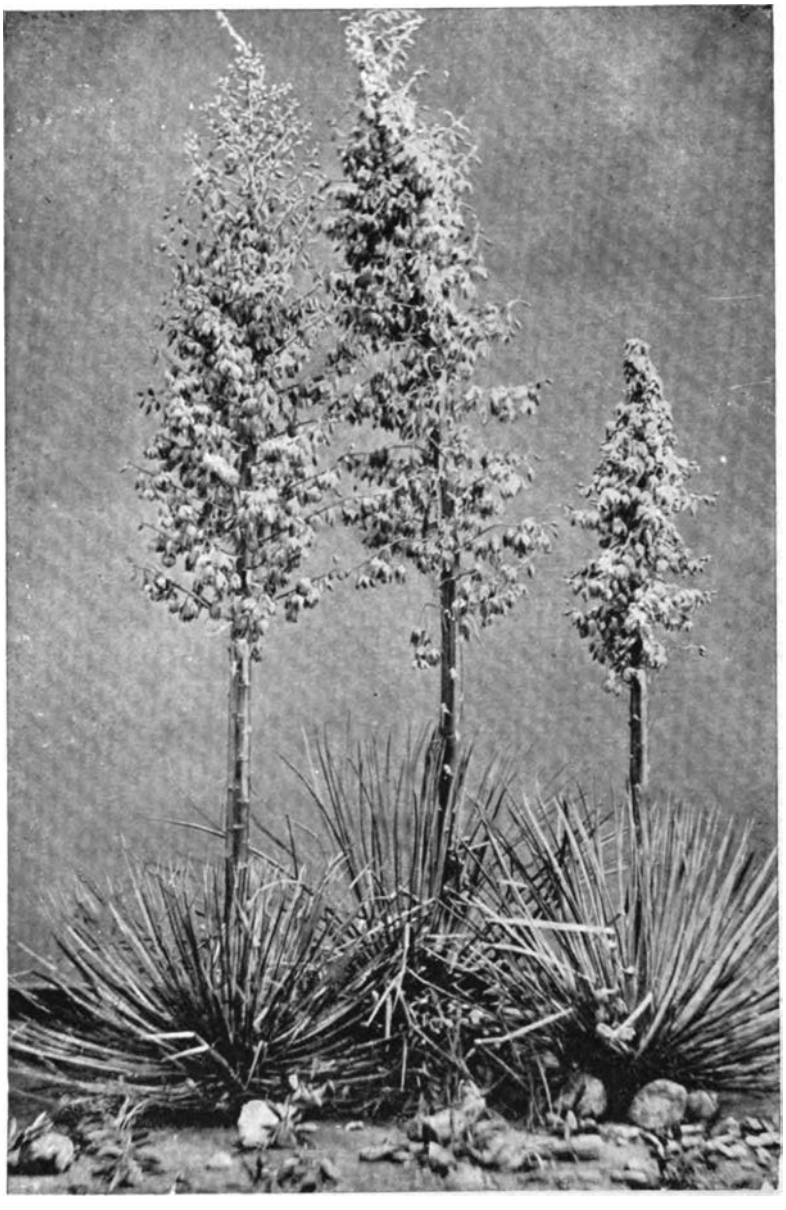

YUCCA WHIPPLEI.

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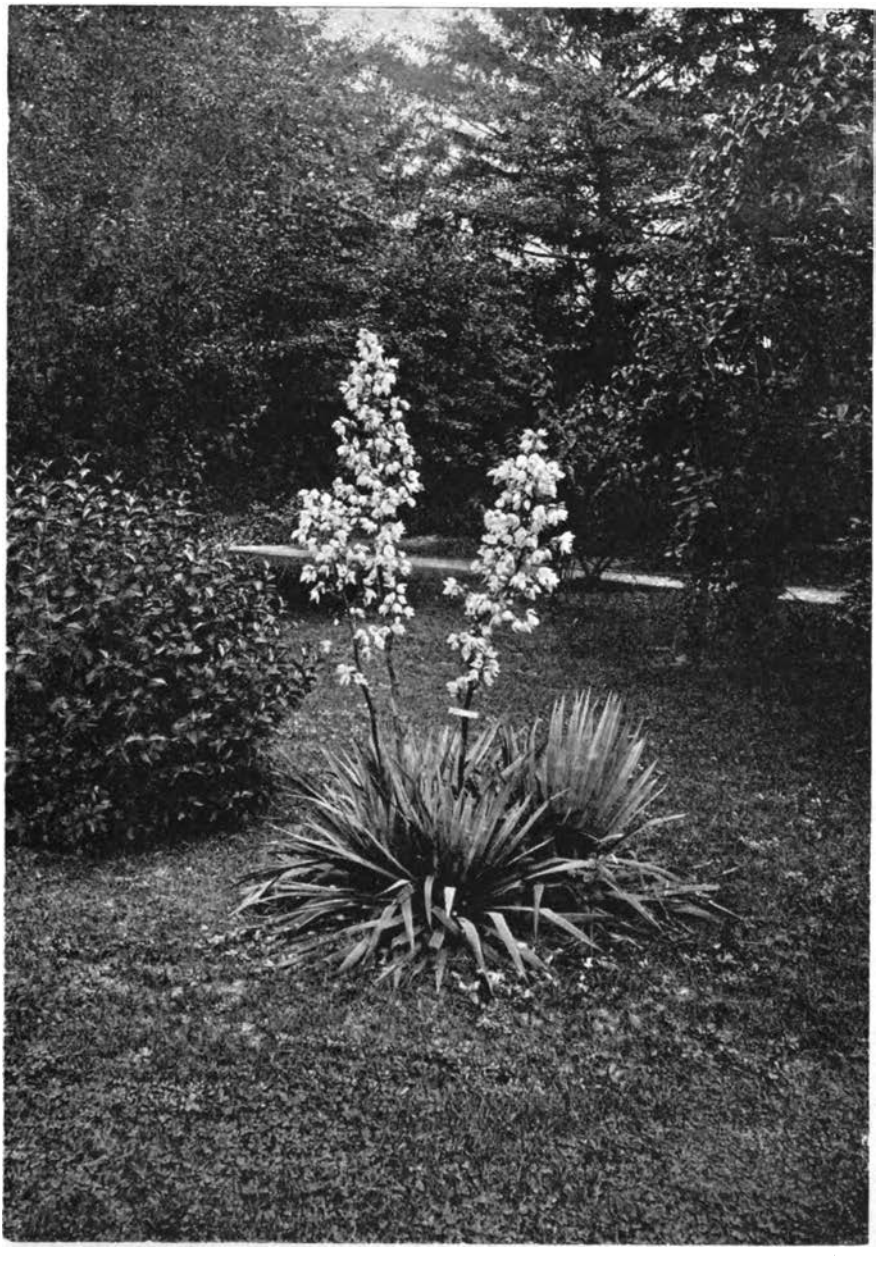

YUCCA FILAMENTOSA.

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ever have borne fruit in European gardens. The difficulties are increased by the fact that in their native homes these plants vary remarkably in the structure and form of even their more important organs, and until fuller examination of native forms can be had we must remain in considerable doubt as to the limits of species. Although Yuccas do not usually bear fruit in Europe, instances are recorded of *Yucca aloifolia* in the botanical gardens in Venice producing both fruit and good seed. The question why the flowers should almost invariably fall has been frequently discussed, and various reasons suggested—such as sexual incompleteness of the flowers, or impossibility of self-fertilization of plants originating from the same stock. The result of some observation during flowering, was that the flowers opened more or less in the evening, and half closed them during the following day, after which they withered. The anthers were observed to open a little before the flowers did, and to expel a large-grained glutinous pollen, which did not seem to readily find its way to the stigma. How is this stigma constituted? The conspicuously papillose termination of the pistil had always been considered the stigma, but closer examination showed its papillæ to be epidermidal appendages, corresponding to similar ones on the filaments, and entirely destitute of stigmatic functions; never did they contribute to the development of a pollen-grain occasionally adhering to them. A minute drop of glutinous liquid was noticed in the tube formed by the coalescence of the so-called stigma. This tube proved to be the real stigma exuding stigmatic liquor, and insects (in these *night-blooming* flowers, of course, *nocturnal* insects) must be the agents which introduced the pollen into the tube. Several different species of beetles were found in the flowers, but the most frequent visitors were the white moths (or "millers"), which were usually in pairs, and after disporting themselves in the open flowers at dusk, were found quietly ensconced in them when closed in daytime. These moths would enter their "ivory palaces" at night, and would be quite sufficient for the purpose of fertilization. The seeds of the Yuccas germinate very easily, the cotyledon remaining partly in the ground within the seed, extracting its liquefied contents, and never grows into a leaf organ. The first leaf issues from a slit in the cotyledon, opposite the remnants of the seed, the first six or eight leaves following the first season, and so on during its growth. From the nodes of the very short axis stout white rootlets break through the back of the cases, the first one through the back of the cotyledon opposite the first leaf, while the original radicle withers away. The Californian *Yucca Whipplei* is the only one in which the axis, together with the base of the leaves, swells up into a sort of bulb. In the second season, a stout cylindrical secondary axis originates from the axil of one of the earliest of last year's leaves covered with scale-like leaf rudiments, and eventually producing from its nodes the rootlets which are to nourish the plant. The secondary axis takes a horizontal direction, especially in the different forms of *Yucca filamentosa*; only in *Yucca augustifolia* it has always been found to grow straight downwards, continuing this direction through at least the third and fourth year, and perhaps longer. Some observations seem to indicate that *Yucca glorio a* develops in a similar manner. The terminal bud of this secondary axis does not seem to form leaves as long as the primary leaf-bud continues to grow, and probably not until it has produced a flowering stem, and perhaps not even then for years. At last, however, the secondary axis branches out, if horizontal, near the surface of the soil, if perpendicular, as in *Yucca augustifolia*, at a certain depth, even two or three feet, below it, forming horizontal branches, and eventually sending out leafy shoots above the surface. Some species are surrounded by such offshoots, thus forming clumps or thickets; *Yucca baccata*, *Yucca gloriosa*, *Yucca filamentosa*, behave in this way, while *Yucca angustifolia* is said to do so much more sparingly, and *Yucca aloifolia* quite rarely. While the rootlets of Yuccas annually spring from the youngest part of the rootstock, and decay again after a season, the rootstock itself often increases to a large size and irregularly branched shape. We have very little definite date about the form of this organ. *Yuccu angustifolia* usually exhibits a perpendicular rootstock of a finger's thickness, and two or three feet long "rising from" (it is evident from

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what is stated above, that it is rather "descending to") a long horizontal simple or branching part, one, or one and a-half inches thick, exhibiting many knobs and buds of future shoots. *Yucca rupicola* has a rootstock consisting of a few thick club-shaped horizontal branches, one to two feet long. The tree-like *Yucca Treculiana* has few short thick club-shaped horizontal branches to its rootstock, sometimes only a single short and very stout knob, which does not seem to readily sprout out. It would be interesting to study these conditions in other species in their native localities. The rootstock of all the Yuccas is, under the name of "Amole," an important article in a Mexican household, being everywhere used as a substitute for soap, as it is replete with mucilaginous and saponaceous matter, probably a substance analogous to the saponine of the Saponaria root. The natives of South Carolina have been known to repeatedly destroy some carefully preserved clumps of Yuccas in order to obtain the saponaceous rootstock. The trunk of the Yuccas either remains entirely below the surface, or it takes different degrees of development above ground. Heretofore specific characters were partly based on such differences, but we know now that only few species are regularly and always acaulescent (*Y. rupicola*), while others, when in a perfect or flower-bearing state, always have trunks (*Y. aloifolia* and *Y. Treculiana*, though this species was first described as stemless); a certain number, usually counted as acaulescent, under favourable circumstances make short trunks, sometimes of only a few years' duration (*Y. filamentosa*, and still more *Y. angustifolia*), and others, again, among them most notably *Y. baccata*, are absolutely stemless near their northern limits, while the farther south we meet them the higher and more tree-like their trunk grows. The primary axis of the Yuccas is terminated by the inflorescence, and its apex dies with it. The plant is then rejuvenated by lateral buds either from the same axis, or from the subterranean rootstock. In the first instance the buds appear about the time of the maturity of the fruit in the trunk-bearing forms from the axils of the uppermost, in the stemless ones from those of the lowest leaves.

(*To be continued.*)

CAPTAIN GEORGE DANA PORTER,

WHO WAS KILLED WHILE UPON A COLLECTING EXPEDITION.

THOUGH still a young man at the time of his tragic death, he had lived longer, measured by the adventures and experiences of active life, than most men who have reached the allotted fourscore years and ten.

He left home at the age of thirteen and began his apprenticeship as a sailor upon the great lakes. He avoided that common pitfall of a sailor's life—strong drink—and employing his leisure hours in profitable study, he learned navigation, and before the age of twenty was master of a schooner. The years spent upon these great northern lakes were by no means devoid of adventure and of danger, that chapter of his life closing with a shipwreck in a winter gale, and his rescue after having being lashed to the rigging for twenty hours, the ropes and his clothing being coated with ice from the freezing spray. The adventurous spirit of the young sailor sought a wider field, and he went to New York and shipped for a foreign port. For the next seven or eight years he shipped from port to port, usually in the capacity of a mate, and seldom visiting the same part twice. Each cruise took him to a new quarter of the world; strange countries and new coasts were visited in rapid succession, Thus he visited almost every great maritime part in the world. Space, of course, forbids even a mention of the varied experiences of these years. For a short time he left the sea; and we find him with surveying parties, running lines for railroads through Mexico and in the western portions of the United States. The Cacti and other strange forms of vegetable life encountered greatly interested him, and years after he was able to recall and describe with much detail many of the trees and plants that he had seen in these countries.

But the sea had the greater attraction

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for him, and he crossed the mountains and the desert to the Pacific coast. But he was tired of the monotony of long voyages, and he determined to locate in California, and engage in sealing and sea hunting on the Mexican and Californian coasts.

The Mexican territory of Lower California was almost unknown at that time, and a rich field for the naturalist and collector. Captain Porter took several such parties down the coast from San Diego, where he made his home. His mind was of the observing and analytical type, and what he saw he studied and remembered. He had travelled much and seen much, and had an immense fund of useful knowledge at his command. He knew the sea as the hunter knows the forests. He spoke Spanish almost as well as he did his mother tongue. Small wonder, then, that his reputation as a pilot for collectors grew apace, and that he himself, having the advantages of such company, became an expert collector of natural history specimens. Seven years spent on the seven hundred miles of coast south of San Diego, and in the interior of the peninsula, rendered him intimately familiar with the geography and topography of the country. The Captain of the United States coast survey cruiser *Ranger* declared that Captain Porter had a more intimate knowledge of the Lower California coast, its harbours, islands, bars, shoals, tides, currents, &c., than any other man living, and was the best seaman he had ever met for a man of his years.

Captain Porter received but a common school education as a boy. But to say that he was not an educated man would be to go wide of the mark. He was a deep student, but his knowledge was not that of the universities. He had studied from the broad pages of the book of nature.

While most of his labours were in the field of conchology, he had done much collecting in other lines, especially of Cacti and plants and woods.

In personal manners Captain Porter was quiet and retiring. Too modest to boast of his achievements, and seldom speaking of his experiences unless drawn out in conversation. A courteous gentleman in manners, he was cordial and warm-hearted, a good friend, and generous to a fault. Cool-headed and self-possessed, on many occasions he has given most convincing proof of his courage and intrepidity.

The real work of his life began when he became a collector, and had his life been spared till the average age of man it is safe to predict that his name would have been a familiar one among naturalists the world over. He was about forty years old at the time of his death.

Details of the Murder.

Special Despatch to the "Chronicle."

San Diego, November 6th.—Armed only with a shotgun, Captain Porter, of the little schooner *World*, faced a full hundred Seri savages on the shore of Tiburon Island and died fighting. When he at last fell, pierced by many balls, he had sent five of the red murderers to earth. He made his last stand in his boat, and even when mortally wounded raised his gun and fired his last two shots. It was a brave, hopeless fight against overwhelming odds.

The reports received here last Wednesday concerning the murder of Captain Porter and Sailor John Johnson, of the *World*, on Tiburon Island, in the Gulf of California, were confirmed by letters received from G. W. Beermaker, of this city, who telegraphed the first news from Hermosillo, and from Frank M. Crocker, United States Consular Agent at Guaymas.

The advices give a thrilling account of the defence made by Captain Porter. The letter from Mr. Beermaker is from Carbo, Sonora, November 4th, addressed to his partner, H. C. Robbins, in this city, and is as follows:—

"I suppose you have heard of Captain Porter and his sailor, Johnson, of the junk *World*, being killed at Tiburon Island. The party bringing the information says: 'Porter stood up and fought to the very last, but Johnson fell at the first volley. Porter killed five Indians before he gave up. He fought like a lion. The Indians say he fell in his small boat, bleeding from wounds in the head, and they thought him dead; but he jumped up once more and fired two more shots into the band of Indians, and then fell over dead.

"Porter had only a shotgun loaded with birdshot, and, the Indians having good rifles, he had no show whatever. It was a cold-blooded massacre.

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"The Mexicans have a saying, 'If you go to Tiburon you will be killed,' and they leave the island strictly alone; so I do not think anything will be done here by the Mexican Government. The Mexican who brought the news says the Indians told him they never saw a man fight as Captain Porter did. He ran for the boat, firing as he went, and bringing down five out of the hundred Indians who surrounded him. I don't believe there is any mistake about this report, as the Mexican who told me these things had the name of the men and the boat in his memorandum book. I hope there may be some error, but I am afraid the boys are gone."

A more interesting and detailed account of the tragedy is given in a statement forwarded by Consular Agent Crocker to the shell store in this city, in which Captain Porter was a partner, and which had asked for particulars when his murder was reported here. This statement was taken by Captain Porter's friends and business associates as a confirmation of reports heretofore received, since it was made by a Mexican official who claims to have witnessed the murder.

The letter from the Consular Agent translating the story is as follows:—

"Guaymas (Sonora, Mexico), November 3rd, 1897.—World Shell Store, San Diego, Cal.—Gentlemen.—Enclosed herewith I hand you statement of Martin Mendez, relative to the supposed killing of Captain Porter and a companion named Johnson, by the Seri Indians, at Tiburon Island. If the statement is true, and I have no reason to think it otherwise, I fear there is no hope of their escape. Captain Porter was warned against touching at Tiburon Island, and I cannot see why so experienced a man as he was should do so.—I am, very respectfully, "Frank M. Crocker,

"United States Consular Agent.

"P.S.—I forward the statement in Spanish simply because I have not time to have it properly translated. I asked for it Monday, and have just received it, 5.40 p.m. "F. M. C."

Translated, the statement is as follows:—"On the 21st ult. I was told by the citizen, Martin Mendez, captain of the schooner *Otila*, the following: I have the honour to notify you that on the 5th day of October we arrived at the Island of Tiburon at 9 p.m., and on account of the calm and strong current, had to anchor off the Datil, in which place, on the next morning at daybreak, four Seri Indians appeared, crying to us, 'Countrymen, we are friends. Come ashore.' But instead of doing so we retired, as we saw that they had arms hidden, and acted suspiciously. Suspecting that they wanted to capture us, we sailed away. When they saw they could not deceive us, they began to shoot, firing about ten or twelve shots.

"We retired outside, and on the following day arrived at the Island of San Estaban, where we remained six days. As we encountered bad weather and found we had to run for it, we returned to the Island of Tiburon, anchored in the lower end of the Boca del Infiernillo (mouth of the little hell), the strait separating the island from the main land, where we were favoured by the wind.

"It was about 11 a.m., when there appeared a canoe rowed by two Indians, who fled immediately when they saw us. We, to satisfy ourselves as to who they were, sent out a canoe, manned by the mate, Merced Valenzuela, and four sailors, who followed the Indians about four miles. At the same time that we made sure they were Indians we noted a vessel of two masts which was inside the strait, and, as Valenzuela believed it was Francisco Boulles' vessel, he drew near it until he discovered that it was an American vessel that had been in Guaymas, whose owners were in search of bird feathers.

"At that place the Indians opened up a fire so fierce that our boat was forced to retire, coming back to the vessel and firing as they came. The American vessel was surrounded by about 100 Indians, who were seen by our men to be taking objects from the schooner. But as we could not give help to the Americans on account of the great numbers of the Indians, and believing them to be assassinated, I resolved to return to give to the first official I might encounter in this place an account of the affair, so that the authorities might take such steps as they thought convenient

"I have the honour to transcribe this to you for your better information. Liberty and Constitution."

"Rafael Legrand,

"Celador de Vigilancia,

"*Los Angeles Bay, October 24th*, 1897."

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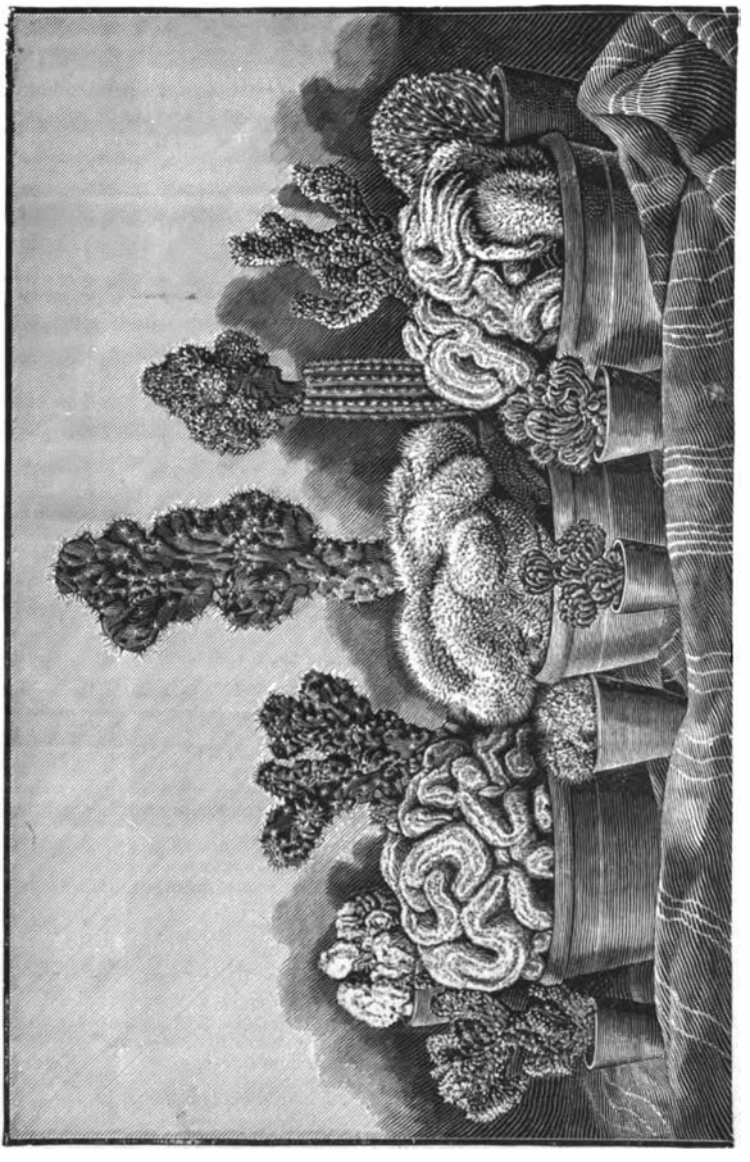

A GROUP OF CRISTATE AND MONSTOSE CACTI.

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F. A. WALTON,

THE FRIARY, HANDSWORTH,

BIRMINGHAM,

OFFERS THE FOLLOWING

NEW AND RARE CACTI,

That he has lately collected or purchased while in America, at extremely low prices.

A LIBERAL DISCOUNT ALLOWED TO THE TRADE.

Echinocereus Engelmanni, in many shades, from almost white, yellow, straw, brown and mixed coloured long spines, from 2s. 6d. a head. A few grand clumps with many heads at same price per head.

Echinocactus cylindraceus longispinus, all sizes, from 2 inches high to 3 feet, many with long twisted spines from 6 to 8 inches long. Price, 2s. 6d. to £5 each.

Cereus Pringlei. This is from Lower California, and greatly exceeds *Cereus giganteus* in size. Very rare. From 7s. 6d. to £2 each. New.

Echinocactus Grusoni, the Golden Cactus. I have a grand lot in splendid condition, from 3 inches to 16 inches across. Price, 3s. to £3 each.

Anhalonium Williamsi and *Lewini*, splendid plants. 2s. 6d. to 5s. each.

Echinocactus viradescens, from 4 inches to 16 inches across. Splendid plants. 2s. to £2 each.

Mammillaria Hessiana, also *longispina* and *rubispina*, quite new and very beautiful. From 2s. 6d. to 20s. each.

Echinocactus Polycephalous, very rare. Some are immense clusters, up to 3 feet across. Small plants, 5s., to large, £4 each.

Pilocereus senilis. I have secured a beautiful lot of extra long white-haired plants, from 3 to 15 inches high. Price, 3s. to 15s. each.

M. Nogalensis, in single plants or clusters, up to 50 in a cluster. Price, from 2s. a head.

M. Applanata, splendid single plants, from 3 inches to 9 inches across. 2s. to 10s. each.

Echinocereus spinosus, splendid plants, single heads or clusters. From 2s. a head.

Echinocereus chloranthus, in great variety. This is one ef the most beautiful variegated long-spined cacti. Single heads or clusters, From 2s. a head.

Cereus gemmatus, good imported plants, 3 inches to 15 inches high. 2s. to 7s. 6d. each.

Echinocactus Wislizenii, splendid plants, from 8 inches to 3 feet high. 7s. 6d. to £20 each.

Echinocactus Emoryi. From 10s. to 40s. each, large. The fish-hook cactus.

Echinocereus Mojavensis, very rare, in single heads or clusters, up to 50 heads. 2s. 6d. a head.

Echinopsis Muhelleri, from 3 inches to 10 inches high. 2s. 6d. to 20s. each, grand plants in bud.

Mammillaria Sanguinea, beautiful red spines, large plants. From 3s. 6d. to 15s. each.

Opuntia chloratica, a very large golden spined handsome Opuntia, about 9 inches across. From 2s. each.

Mammillaria Palmeri, a little gem, mostly in clusters of 3 to 10. From 2s. a head. New.

M. Goodrichii, the *true* variety, from Lower California, with large pink flowers, one of the most distinct and beautiful of all the mammillarias. 3s. a head, very rare.

M. Dioica, this is usually sold for *Goodrichii*, but is not so beautiful, either in flowers or spines; grows mostly in clusters. From 1s. 6d. a head.

Echinocereus Brandegii, one of the most distinct and rarest plants offered. The spines are immensely strong and varied in colour. From 5s. to 20s. each. New.

Mammillaria settispinus, with white hooked spines, 1½ inches long, very rare. From 5s. to 10s. each. New.

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Mammillaria Pondi, similar to above, but finer spines and brown. 5s. to 10s. each. New.

Mammillaria rosiana, new and very rare, from 4 inches to 12 inches high. 7s. 6d. to 20s. each.

Echinocactus rubidus superbissimus, from 4 inches to 10 inches high, with bright red spines. 5s. to 20s. each. New.

Echinocactus Junori. 5s. to 10s. each. New.

Echinocactus Barcelona. 3s. to 7s. 6d. each.

Mammillaria macromeris, some beautiful clusters. From 3s. to 10s. each.

M. Elegans, splendid established plants. From 2s. to 10s. each.

M. Pfeifferi, the golden mammillaria, a good hardy kind. 2s. to 10s. each.

M. Grayhami, pretty hooked variety, very hardy. 2s. to 5s. each; clusters, 2s. a head.

ECHINOCEREUS CANDICANS, the *rainbow* cactus. This is really the very finest large flowering cactus I have. I can offer some last year's well established plants, covered with buds. The flowers are about 4 inches across. Plants from 3 inches to 12 inches high. 2s. to 20s. each.

M. Arizonica, neat white clusters, large flowers. From 1s. a head.

O. Basilaris, imported joints. From 1s. each.

O. Albiflorus, established. 2s. 6d. each.

Pilocereus Schottii, one of the wonders of nature. It is covered with thousands of stiff bristle-like spines, 3 or 4 inches long, standing out at right angles from plant. I only have a few plants about a foot high. Price from 20s. each.

Cereus General Henriques, a very singular knotted form of columnas cereus, quite new and grotesque; plants 6 inches to 5 feet high. Price, 20s. to £5 each.

Cereus Amalonga cristata, the strangest cristate or monstose cactus yet seen. Plants, from 2 feet to 5 feet, £5 to £20.

Cereus flagilliformis cristatus, grand plants, from 2s. 6d. I have a few grafted from 10s.

Opuntia Parrayi, a strange plant, almost hidden by its long deflexed spines. From 2s. 6d. each. New.

Mammillaria cirreferra longispina, in clusters. From 2s. 6d. a head. This is a grand variety.

Echinocereus maretiumus, from Lower California, a very rare plant, in large and small clusters. 2s. a head.

Pilocereus Sargentianus, a handsome bold-looking plant, 6 to 18 inches high. From 5s. to 25s. each.

Mammillaria Potosina, a beautiful variety from Mexico. 2s. 6d. to 10s. each.

Echinocactus horizonthalonius, fine imported plants. 5s. to 20s. each.

Anhalonium Sulcatum. From 5s. each, very rare.

,, *Prismaticum*. 5s. to 7s. 6d. each.

,, *Fissuratum*. 5s. to 7s. 6d. each.

Astrophytum myriostigma. 5s. to 10s., very fine.

Echinocactus turbineformis. From 5s. each, very rare.

Echinocereus viridiflorus. From 2s. 6d. each.

Cereus Emoryi, golden velvet. From 2s. 6d. to 20s.

Pelecophora asceleformis. From 2s. 6d. Rare.

Leuchtinbergia principis, very rare. From 10s. to 30s.

Echinocactus ornatus, large. From 7s. 6d. to 20s.

Cereus ereuca, the caterpillar cactus, very rare and strange. 10s. to 30s. each. New.

Mammillaria Brandegii, new. 2s. 6d. to 5s.

Echinocactus chrysanthus, very good plants, rare. From 10s. to 40s. New.

Echinocactus rectispinus, with immensely long hooked spines, plants 4 inches to 8 inches across. Price 7s. 6d. to 20s., quite new.

Echinocactus Fordei, a new grey spined kind, very distinct. 7s. 6d. to 20s.

Melocactus Salvados, a new rare melocactus, good plants, with caps. From 20s. each.

Mammillaria Rebsamiama, new and distinct. From 3s. a head, single or in clusters.

Echinocatus denudatus, in great variety, from Paraguay. From 2s. 6d. to 10s., according to size. Many are in bud and flower.

Echinocactus Polyancistrus, very beautiful, purplish red and white, hooked long spines. One of the showiest plants grown, 6 inches to 12 inches. From 10s. to 30s. each.

OPUNTIA GRIZZLY BEAR, the strangest of all the new cacti. The hair-like spines are from 6 to 8 inches long, completely hiding the plant. From 6 inches to 18 inches, single or in clusters. 5s. to 30s. each.

OPUNTIA ENGELMANNI CRISTATA. This is an exceptionally strange-looking plant. No two plants resemble each other in the least. Price from 20s. to 60s. each.

FOURQUIREA COLUMNARIS, quite new, from Lower California, size 6 inches to 12 inches high. 10s. to 40s. each

Fourquirea spinosa, from the desert, 2 feet to 4 feet high. 10s. to 40s. each.

Melocactus Communis, just arrived from the West Indies. From 10s. to 30s. each.

FURTHER PARTICULARS UPON APPLICATION.

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A. H. ALVERSON,

SAN BERNADINO, CALIFORNIA, U.S.A.

SEND for my Catalogue of **Cacti, Euphorbias,** and other **Succulents,** POST FREE.

The following is a short list of Specialities, many of which were introduced by me. I am constantly finding Novelties, one of which, OPUNTIA BASILARIS (*white flowered*), is now offered for the first time.

ECHINOCACTUS POLYANCISTRUS, E. JOHNSONI, E. POLYCEPHALUS, E. CYLINDRACEUS;
ALSO
LONGISPINUS, MAMMILLARIA, PHELLOSPERMA, M. ALVERSONII, M. PALMERI, **OPUNTIA GRIZZLY BEAR,** O. BASILARIS CORDATA, O. TESSELLATA CRISTATA, O. ECHINOCARPA, ETC.

I can supply at Moderate Prices, Wholesale or Retail.

MEXICAN CACTI
AND
ORCHIDS.

I am the Discoverer of the following RARE CACTI, and shall be glad to send Prices of these and other rarities upon application.

CEREUS CARMEN MURILLO.
CEREUS GENERAL ENRIQUEZ.
MAMMILLARIA REBSAMIANA.
MELOCACTUS SALVADOR.
OPUNTIA BETANCOURT, ETC., ETC.

ADDRESS—

Professor LOUIS MURILLO, Jalapa, Vera Cruz, Mexico.

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The Cactus Journal.

Vol. II. No. 19. AUGUST, 1899. Price Sixpence.

EDITORIAL.

The exceptionally hot weather is just splendid for Cactus fanciers. The plants should be growing in grand style. Of course they want more water, but don't keep constantly wet or even moist; rather let the plants get dry, then water twice, about an hour apart, to insure a good wetting.

***

Cacti in greenhouses should be served as above about every three days. A little spraying with a syringe about 6 o'clock in the evening will do a lot of good, and tend to keep the plant free from insects.

***

If any of the plants are turned out of doors in pots, do not forget to water quite as regularly as those in the house.

***

Even if it rains, it is seldom enough to thoroughly wet the soil of a pot-plant. Those, however, that are planted out in the garden, and the pots removed first, do not require watering, unless the ground becomes very dry indeed.

***

We have a number of *Echinocacti*, *Echinocereus*, *Echinopsis*, etc., in flower out-of-doors, in a large round bed, and they have had positively no attention since the end of May, when they were first planted out, except the weeds being removed. By-the-bye, removing weeds among Cacti is not the easiest thing, for they will grow right in the spiniest and prickliest part of the bed.

A young lady of our acquaintance contrived a very effective tool to remove those weeds without being scratched. She procured a small wire toasting-fork, bent the prongs nearer together, and then doubled the points into a hook form. This is very effective, and saves the hands.

***

We received the notice, last month, of another success of Mr. H. G. Bourne, at Wood Green Flower Show, again gaining a medal for a display of Cacti and Succulent plants.

***

He exhibited 100 plants, each distinct. The show was held at the Alexandra Palace.

***

The notice of the above came too late for the July issue of the Journal. We take this opportunity of congratulating Mr. Bourne.

***

Why don't other growers follow his lead, and exhibit their plants?

***

The secretary of the National Cactus Society says that people are so careful of their plants they don't care to risk them. There is not much risk in sending their plants in a van if properly packed; and we earnestly hope we shall see more Cacti at the various flower shows.

***

We know there are many good collections, and think the public would be much interested if they could be seen more often.

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